ATTACHMENT D1

RESIDENTIAL NO ACTION LEVEL SCREENING VALUES

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D1. RESIDENTIAL NO ACTION LEVEL SCREENING VALUES

The Risk Methods Document (RMD) (DOE 2011) identified those constituents considered potential chemicals of potential concern (COPCs) at the Paducah Gaseous Diffusion Plant (PGDP) and tabulated their no action levels (NALs). Several constituents were detected in samples evaluated for the Soils Operable Unit (OU) Remedial Investigation for which there were no tabulated child residential NALs in Table A.4 of the RMD. This residential NAL is used in the risk assessment for identification of potential COPCs; therefore, it was necessary to develop child resident NALs consistent with the approach documented in the RMD to identify COPCs in the risk assessment. These constituents are listed in Table D1.1.

Table D1.1. Soils OU Constituents with No Published PGDP Tabulated Residential NALs

Metals	
Lithium	
Organics	
1,1,1-Trichloroethane	Bis(2-ethylhexyl)phthalate
1,1,2-Trichloroethane	Bromomethane
1,1-Dichloroethane	Butyl benzyl phthalate
1,2,4-Trichlorobenzene	Carbon disulfide
1,2-Dichlorobenzene	Chlorobenzene
1,2-Dichloroethane	Dibenzofuran
1,3-Dichlorobenzene	Dibromochloromethane
1,4-Dichlorobenzene	Diethyl phthalate
2,4-Dimethylphenol	Dimethyl phthalate
2,4-Dinitrotoluene	Di-n-butyl phthalate
2,6-Dinitrotoluene	Di-n-octylphthalate
2-Butanone	m,p-Cresol
2-Hexanone	Methylene chloride
2-Methylnaphthalene	N-Nitrosodiphenylamine
2-Methylphenol	Pentachlorophenol
4-Methyl-2-pentanone	Phenanthrene
Acenaphthylene	Phenol
Acetone	Styrene
Benzenemethanol	Toluene
Benzo(ghi)perylene	Vinyl acetate
Benzoic acid	
Radionuclides	
Cesium-134	
Thorium-228	
Thorium-232	

Available toxicity values for these constituents are listed in Table D1.2. The derived cancer and noncancer NALs used as residential screening values to identify COPCs are presented in Table D1.3. Consistent with the RMD, the noncancer NAL is based on the child resident and the NAL for carcinogens is based on the aggregate resident (30-year exposure). This table also provides the maximum detected concentration in surface and subsurface soil samples.

Table D1.2. Toxicity Values and Information Used in PRG Derivation

Chemical Abstract Number	Analyte	GI Absorption Factor (Unitless)	Oral RfD (RfDo)	Absorbed Dose (RfDd)	Inhalation (RfCi)	Inhalation (RfDi)
7439932	Lithium	1.00E+00	2.00E-03	2.00E-03	-	
71556	1,1,1-Trichloroethane	1.00E+00	2.00E+00	2.00E+00	5.00E+00	1.43E+00
79005	1,1,2-Trichloroethane	1.00E+00	4.00E-03	4.00E-03	2.00E-04	5.71E-05
75343	1,1-Dichloroethane	1.00E+00	2.00E-01	2.00E-01	5.00E-01	1.43E-01
120821	1,2,4-Trichlorobenzene	1.00E+00	1.00E-02	1.00E-02	2.00E-03	5.71E-04
95501	1,2-Dichlorobenzene	1.00E+00	9.00E-02	9.00E-02	2.00E-01	5.71E-02
107062	1,2-Dichloroethane	1.00E+00	6.00E-03	6.00E-03	7.00E-03	2.00E-03
541731	1,3-Dichlorobenzene	1.00E+00	-		-	
106467	1,4-Dichlorobenzene	1.00E+00	7.00E-02	7.00E-02	8.00E-01	2.29E-01
105679	2,4-Dimethylphenol	1.00E+00	2.00E-02	2.00E-02	-	
121142	2,4-Dinitrotoluene	1.00E+00	2.00E-03	2.00E-03	-	
606202	2,6-Dinitrotoluene	1.00E+00	1.00E-03	1.00E-03	-	
78933	2-Butanone	1.00E+00	6.00E-01	6.00E-01	5.00E+00	1.43E+00
591786	2-Hexanone	1.00E+00	5.00E-03	5.00E-03	3.00E-02	8.57E-03
91576	2-Methylnaphthalene	1.00E+00	4.00E-03	4.00E-03	-	
95487	2-Methylphenol	1.00E+00	5.00E-02	5.00E-02	6.00E-01	1.71E-01
108101	4-Methyl-2-pentanone	1.00E+00	8.00E-02	8.00E-02	3.00E+00	8.57E-01
208968	Acenaphthylene	1.00E+00	-		-	
67641	Acetone	1.00E+00	9.00E-01	9.00E-01	3.09E+01	8.83E+00
100516	Benzenemethanol	1.00E+00	1.00E-01	1.00E-01	-	
191242	Benzo(ghi)perylene	1.00E+00	-		-	
65850	Benzoic acid	1.00E+00	4.00E+00	4.00E+00	-	
117817	Bis(2-ethylhexyl)phthalate	1.00E+00	2.00E-02	2.00E-02	-	
74839	Bromomethane	1.00E+00	1.40E-03	1.40E-03	5.00E-03	1.43E-03
85687	Butyl benzyl phthalate	1.00E+00	2.00E-01	2.00E-01	-	
75150	Carbon disulfide	1.00E+00	1.00E-01	1.00E-01	7.00E-01	2.00E-01
108907	Chlorobenzene	1.00E+00	2.00E-02	2.00E-02	5.00E-02	1.43E-02
132649	Dibenzofuran	1.00E+00	1.00E-03	1.00E-03	-	
124481	Dibromochloromethane	1.00E+00	2.00E-02	2.00E-02	-	
84662	Diethyl phthalate	1.00E+00	8.00E-01	8.00E-01	-	
131113	Dimethyl phthalate	1.00E+00	-		-	
84742	Di-n-butyl phthalate	1.00E+00	1.00E-01	1.00E-01	-	
117840	Di-n-octylphthalate	1.00E+00	4.00E-02	4.00E-02	-	
P2	m,p-Cresol		5.00E-03	0.00E+00	6.00E-01	1.71E-01
75092	Methylene chloride	1.00E+00	6.00E-02	6.00E-02	1.04E+00	2.97E-01
86306	N-Nitrosodiphenylamine	1.00E+00	-		-	
87865	Pentachlorophenol	1.00E+00	5.00E-03	5.00E-03	-	
85018	Phenanthrene	1.00E+00	-		-	
108952	Phenol	1.00E+00	3.00E-01	3.00E-01	2.00E-01	5.71E-02
100425	Styrene	1.00E+00	2.00E-01	2.00E-01	1.00E+00	2.86E-01
108883	Toluene	1.00E+00	8.00E-02	8.00E-02	5.00E+00	1.43E+00
108054	Vinyl acetate	1.00E+00	1.00E+00	1.00E+00	2.00E-01	5.71E-02
13967709	Cesium-134					
14274829	Thorium-228					
N2608	Thorium-232					

Table D1.2. Toxicity Values and Information Used in PRG Derivation (Continued)

Chemical Abstract Number	Analyte	Oral Slope Factor (SFo)	Oral Slope Factor for Water (SFow)	Oral Slope Factor for Soil (SFos)	Absorbed Dose Slope Factor (SFd)	Inhalation Slope Factor (SFi)	External Exposure Slope Factor (SFe)
7439932	Lithium	-					
71556	1,1,1-Trichloroethane	-					
79005	1,1,2-Trichloroethane	5.70E-02			5.70E-02	5.60E-02	1.60E-05
75343	1,1-Dichloroethane	5.70E-03			5.70E-03	5.60E-03	1.60E-06
120821	1,2,4-Trichlorobenzene	2.90E-02			2.90E-02		
95501	1,2-Dichlorobenzene	-					
107062	1,2-Dichloroethane	9.10E-02			9.10E-02	9.10E-02	2.60E-05
541731	1,3-Dichlorobenzene	-					
106467	1,4-Dichlorobenzene	5.40E-03			5.40E-03	3.85E-02	1.10E-05
105679	2,4-Dimethylphenol	-					
121142	2,4-Dinitrotoluene	3.10E-01			3.10E-01	3.12E-01	8.90E-05
606202	2,6-Dinitrotoluene	-					
78933	2-Butanone	-					
591786	2-Hexanone	-					
91576	2-Methylnaphthalene	-					
95487	2-Methylphenol	-					
108101	4-Methyl-2-pentanone	-					
208968	Acenaphthylene	-					
67641	Acetone	-					
100516	Benzenemethanol	-					
191242	Benzo(ghi)perylene	-					
65850	Benzoic acid	-					
117817	Bis(2-ethylhexyl)phthalate	1.40E-02			1.40E-02	8.40E-03	2.40E-06
74839	Bromomethane	-					
85687	Butyl benzyl phthalate	1.90E-03			1.90E-03		
75150	Carbon disulfide	-					
108907	Chlorobenzene	-					
132649	Dibenzofuran	-					
124481	Dibromochloromethane	8.40E-02			8.40E-02	9.45E-02	2.70E-05
84662	Diethyl phthalate	-					
131113	Dimethyl phthalate	-					
84742	Di-n-butyl phthalate	-					
117840	Di-n-octylphthalate	-					
P2	m,p-Cresol	-					
75092	Methylene chloride	7.50E-03			7.50E-03	1.65E-03	4.70E-07
86306	N-Nitrosodiphenylamine	4.90E-03			4.90E-03	9.10E-03	2.60E-06
87865	Pentachlorophenol	4.00E-01			4.00E-01	1.79E-02	5.10E-06
85018	Phenanthrene	-					
108952	Phenol	-					
100425	Styrene	-					
108883	Toluene	-					
108054	Vinyl acetate	-					
13967709	Cesium-134		4.22E-11	5.81E-11		1.65E-11	7.10E-06
14274829	Thorium-228		1.07E-10	2.89E-10		1.32E-07	5.59E-09
N2608	Thorium-232		1.01E-10	2.31E-10		4.33E-08	3.42E-10

Table D1.2. Toxicity Values and Information Used in PRG Derivation (Continued)

Chemical Abstract Number	Analyte	Volatile Organic?	PEF Res.	VF Res.	EPA Default ABS (Unitless)	KY Default ABS (Unitless)	Permeability Constant
7439932	Lithium		9.30E+08		-	5.00E-02	1.00E-03
71556	1,1,1-Trichloroethane	Yes	9.30E+08	1.36E+03	-	2.50E-01	1.26E-02
79005	1,1,2-Trichloroethane	Yes	9.30E+08	5.16E+03		2.50E-01	5.04E-03
75343	1,1-Dichloroethane	Yes	9.30E+08	1.68E+03		2.50E-01	6.75E-03
120821	1,2,4-Trichlorobenzene		9.30E+08	1.80E+04		1.00E-01	7.05E-02
95501	1,2-Dichlorobenzene		9.30E+08	7.25E+03		1.00E-01	4.46E-02
107062	1,2-Dichloroethane	Yes	9.30E+08	3.47E+03		2.50E-01	4.20E-03
541731	1,3-Dichlorobenzene		9.30E+08	6.17E+03		1.00E-01	5.20E-02
106467	1,4-Dichlorobenzene		9.30E+08	6.50E+03		1.00E-01	4.53E-02
105679	2,4-Dimethylphenol		9.30E+08	2.88E+05	1.00E-01	1.00E-01	1.09E-02
121142	2,4-Dinitrotoluene		9.30E+08		1.02E-01	1.00E-01	3.08E-03
606202	2,6-Dinitrotoluene		9.30E+08	4.00E+05	9.90E-02	1.00E-01	3.70E-03
78933	2-Butanone	Yes	9.30E+08	1.16E+04		2.50E-01	9.62E-04
591786	2-Hexanone	Yes	9.30E+08	1.13E+04		2.50E-01	3.55E-03
91576	2-Methylnaphthalene		9.30E+08	3.47E+04		1.00E-01	9.17E-02
95487	2-Methylphenol		9.30E+08	1.99E+05	1.00E-01	1.00E-01	7.66E-03
108101	4-Methyl-2-pentanone	Yes	9.30E+08	9.18E+03		2.50E-01	3.19E-03
208968	Acenaphthylene		9.30E+08	1.13E+05	1.30E-01	1.00E-01	9.11E-02
67641	Acetone	Yes	9.30E+08	1.34E+04		2.50E-01	5.12E-04
100516	Benzenemethanol		9.30E+08	1.32E+05	1.00E-01	1.00E-01	2.09E-03
191242	Benzo(ghi)perylene		9.30E+08		1.30E-01	1.00E-01	1.12E+00
65850	Benzoic acid		9.30E+08		1.00E-01	1.00E-01	5.65E-03
117817	Bis(2-ethylhexyl)phthalate		9.30E+08		1.00E-01	1.00E-01	1.13E+00
74839	Bromomethane	Yes	9.30E+08	1.27E+03		2.50E-01	2.84E-03
85687	Butyl benzyl phthalate		9.30E+08		1.00E-01	1.00E-01	3.85E-02

Table D1.2. Toxicity Values and Information Used in PRG Derivation (Continued)

Chemical Abstract Number	Analyte	Volatile Organic?	PEF Res.	VF Res.	EPA Default ABS (Unitless)	KY Default ABS (Unitless)	Permeability Constant
75150	Carbon disulfide	Yes	9.30E+08	1.03E+03		2.50E-01	1.14E-02
108907	Chlorobenzene	Yes	9.30E+08	4.13E+03		2.50E-01	2.82E-02
132649	Dibenzofuran		9.30E+08	1.16E+05		1.00E-01	9.75E-02
124481	Dibromochloromethane	Yes	9.30E+08	6.17E+03	1.00E-01	2.50E-01	2.89E-03
84662	Diethyl phthalate		9.30E+08		1.00E-01	1.00E-01	3.60E-03
131113	Dimethyl phthalate		9.30E+08		1.00E-01	1.00E-01	1.47E-03
84742	Di-n-butyl phthalate		9.30E+08		1.00E-01	1.00E-01	4.20E-02
117840	Di-n-octylphthalate		9.30E+08		1.00E-01	1.00E-01	2.43E+00
P2	m,p-Cresol		9.30E+08			1.00E-01	
75092	Methylene chloride	Yes	9.30E+08	1.83E+03		2.50E-01	3.54E-03
86306	N-Nitrosodiphenylamine		9.30E+08	6.28E+05	1.00E-01	1.00E-01	1.45E-02
87865	Pentachlorophenol		9.30E+08		2.50E-01	1.00E-01	1.27E-01
85018	Phenanthrene		9.30E+08	3.82E+05	1.30E-01	1.00E-01	1.44E-01
108952	Phenol		9.30E+08	2.27E+05	1.00E-01	1.00E-01	4.34E-03
100425	Styrene	Yes	9.30E+08	5.79E+03		2.50E-01	3.72E-02
108883	Toluene	Yes	9.30E+08	2.78E+03		2.50E-01	3.11E-02
108054	Vinyl acetate	Yes	9.30E+08	4.13E+03		2.50E-01	1.57E-03
13967709	Cesium-134		9.30E+08				
14274829	Thorium-228		9.30E+08				
N2608	Thorium-232		9.30E+08				

Table D1.3. Residential NAL Development

CAS	Analyte	Noncancer (Child)	Cancer (Child/Adult)	Residential NAL	Maximum Detected Concentration	Units
7439932	Lithium	9.2	n/a	9.2	8.08	mg/kg
71556	1,1,1-Trichloroethane	146	n/a	146	0.61	mg/kg
79005	1,1,2-Trichloroethane	0.023	0.345	0.023	0.006	mg/kg
75343	1,1-Dichloroethane	17.8	1.34	1.34	0.5	mg/kg
120821	1,2,4-Trichlorobenzene	0.786	6.02	0.786	0.0039	mg/kg
95501	1,2-Dichlorobenzene	29.2	n/a	29.2	0.12	mg/kg
107062	1,2-Dichloroethane	0.515	0.155	0.155	0.012	mg/kg
106467	1,4-Dichlorobenzene	77	0.813	0.813	0.0037	mg/kg
105679	2,4-Dimethylphenol	65.2	n/a	65.2	Not detected	mg/kg
121142	2,4-Dinitrotoluene	6.52	0.563	0.563	Not detected	mg/kg
606202	2,6-Dinitrotoluene	3.26	n/a	3.26	Not detected	mg/kg
78933	2-Butanone	578	n/a	578	0.12	mg/kg
591786	2-Hexanone	4.05	n/a	4.05	0.06	mg/kg
91576	2-Methylnaphthalene	13	n/a	13	0.38	mg/kg
95487	2-Methylphenol	154	n/a	154	Not detected	mg/kg
108101	4-Methyl-2-pentanone	113	n/a	113	0.06	mg/kg
67641	Acetone	1340	n/a	1340	0.4	mg/kg
100516	Benzenemethanol	326	n/a	326	0.073	mg/kg
65850	Benzoic acid	13000	n/a	13000	3.8	mg/kg
117817	**Bis(2-ethylhexyl)phthalate**	**65.2**	**12.5**	**12.5**	**15**	**mg/kg**
74839	Bromomethane	0.134	n/a	0.134	Not detected	mg/kg
85687	Butyl benzyl phthalate	652	91.8	91.8	0.5	mg/kg
75150	Carbon disulfide	14.8	n/a	14.8	0.002	mg/kg
108907	Chlorobenzene	4.07	n/a	4.07	0.006	mg/kg
132649	Dibenzofuran	3.26	n/a	3.26	1.65	mg/kg
124481	Dibromochloromethane	34.8	0.242	0.242	Not detected	mg/kg
84662	Diethyl phthalate	2610	n/a	2610	0.52	mg/kg
84742	Di-n-butyl phthalate	326	n/a	326	22	mg/kg
117840	Di-n-octylphthalate	130	n/a	130	0.054	mg/kg
P2	m,p-Cresol	39.1	n/a	39.1	2.3	mg/kg
75092	Methylene chloride	30.2	3.65	3.65	0.14	mg/kg
86306	N-Nitrosodiphenylamine	n/a	32.2	32.2	0.064	mg/kg
87865	**Pentachlorophenol**	**16.3**	**0.436**	**0.436**	**2.1**	**mg/kg**
108952	Phenol	498	n/a	498	17	mg/kg
100425	Styrene	94.3	n/a	94.3	0.00099	mg/kg
108883	Toluene	96.1	n/a	96.1	0.21	mg/kg
108054	Vinyl acetate	18.3	n/a	18.3	Not detected	mg/kg
13967709	Cesium-134	n/a	0.00956	0.00956	0.00302	pCi/g
14274829	Thorium-228	n/a	2.31	2.31	2.21	pCi/g
N2608	Thorium-232	n/a	3.69	3.69	2.03	pCi/g
Constituents with no toxicity values						
541731	1,3-Dichlorobenzene				0.0028	mg/kg
208968	Acenaphthylene				1.2	mg/kg
191242	Benzo(ghi)perylene				28	mg/kg
85018	Phenanthrene				64	mg/kg
131113	Dimethyl phthalate					mg/kg

n/a = no toxicity value available

Bold indicates the analyte was added as a COPC to the Soils OU risk assessment.

The NALs above were used to identify COPCs in surface and subsurface soils in Tables D.4 and D.5 Table D1.3 also includes the maximum detected concentration in soils (surface and subsurface). Only two chemicals (pentachlorophenol and bis-2-ethylhexyl phthalate) were detected above the residential NAL, and this occurred only for one location for each chemical. This is consistent with the RMD, supporting that the tabulated NALs are constituents of primary interest for evaluating risks at PGDP.

The constituents shown in the list below were detected in Soils OU soils, but have no toxicity values for which to determine screening values.

- Noncarcinogenic polycyclic aromatic hydrocarbons (PAHs)
  - Phenanthrene
  - Benzo(ghi)perylene
  - Acenaphthylene
- 1,3-Dichlorobenzene

Three PAHs detected in samples for which there are no toxicity criteria. Similar to anthracene and pyrene, these are not classifiable as to their carcinogenicity to humans. Although no specific reference doses have been provided by the U.S. Environmental Protection Agency (EPA) for these, frequently they are screened based on values derived for pyrene or other noncarcinogenic PAHs. Kentucky Division of Waste Management Superfund Branch, Petroleum Cleanup Section has provided soil action levels [hazard index (HI = 1)] of 3,400 mg/kg for acenaphthylene and phenanthrene consistent with the EPA Regional Screening Level (RSL) for acenaphthene, and 1,700 mg/kg for benzo(ghi)perylene based on the RSL for pyrene.[1]

The potential uncertainty in the risk assessment for not incorporating hazard quotients for these PAHs was evaluated based on comparing detected concentrations with the PGDP child resident NAL for pyrene of 81.2 mg/kg. This is lower than NALs for noncancer endpoints for other PAHs (e.g. acenaphthylene child resident NAL is 117 mg/kg). The overall patterns in the data also were considered. This review indicated the following:

- None of the concentrations of acenaphthylene, benzo(ghi)perylene, or acenapthylene exceeded the child resident NAL for pyrene of 81.2 mg/kg, so none would have been identified as a COPC for further evaluation.
- The highest concentrations of these PAHs were reported in Solid Waste Management Unit 518 Exposure Unit 1. Other PAHs at this location showed pyrene above the NAL at a concentration of 150 mg/kg and, more importantly, carcinogenic PAHs over 100 mg/kg. These levels clearly identify issues to be further considered for PAHs.

Dichlorobenzenes (DCB). According to Agency for Toxic Substances and Disease Registry, "Very little is known about the health effects of 1,3- dichlorobenzene, especially in humans, but they are likely to be similar to those of 1,2- and 1,4-dichlorobenzene."[2] The child resident NALs for 1,2-DCB is 29.2 mg/kg and for 1,4-DCB is 0.813 mg/kg, both significantly higher than the maximum reported concentration of 1,3-DCB of 0.0028 mg/kg. In addition, it was infrequently reported. These things suggest this compound would not be a COPC or impact the results of the risk assessment.

[1] Accessed at http://dep.ky.gov/formslibrary/Documents/DEP7097C.pdf
[2] Accessed at http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=703&tid=126

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ATTACHMENT D2

EPC UNCERTAINTY EVALUATION

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D2. EPC UNCERTAINTY EVALUATION

Calculation of exposure point concentrations (EPCs) for the Soils Operable Unit (OU) included assignment of the average chemical of potential concern (COPC) concentration to grids within an exposure unit (EU) of a solid waste management unit (SWMU) or area of concern (AOC) for which data were not available in order to fill the empty cell. This process has the potential for introducing an uncertainty into those calculations where there are many empty cells. The uncertainties associated with these calculations are discussed below.

For EUs with 10 or more grids, the EPC was calculated using the grid values to determine the 95% upper confidence limit on the mean concentration (UCL 95). The 89 SWMU/EU combinations for which the uncertainty associated with this process applies are listed in Table D2.1.

Table D2.1. SWMU/EU Combinations with Greater than Ten Grids

SWMU	EU	# GRIDS
Former Facilities		
1	1	14
1	2	12
1	3	12
1	4	12
99	1	16
194	1	19
194	2	13
194	3	17
194	4	23
194	5	20
194	6	12
194	7	16
194	8	12
194	9	13
194	10	12
194	11	12
194	12	12
194	13	15
194	14	13
194	15	16
194	16	16
194	17	12
194	18	12
194	19	12
194	20	12
194	22	12
194	23	12
194	24	12
194	25	10
194	26	12
194	27	12

SWMU	EU	# GRIDS
194	28	12
194	30	13
Storage Areas		
200	1	30
217	1	13
217	2	17
221	1	17
222	1	12
227	1	37
227	2	31
Underground/Tank		
165	1	36
Chromium Areas		
158	1	24
Soil Piles		
138	1	27
138	2	20
180	1	11
180	2	12
180	3	17
180	4	15
181	1	28
195	1	10
195	2	11
195	3	11
195	4	15
195	5	10
195	6	12
195	7	12
195	8	12
195	10	12
195	11	12

SWMU	EU	# GRIDS
195	12	15
195	13	13
195	14	13
195	15	14
195	16	16
195	17	23
541	1	23
561	1	32
561	2	31
567	3	10
567	4	13
Scrap Yards		
14	1	12
14	2	12
14	3	12
14	4	13
14	5	12
14	6	12
14	7	12
14	8	12
14	9	12
14	10	12
518	1	22
520	1	14
520	2	15
520	3	15
520	4	15
520	5	11
PCB Areas		
81	1	26
153	1	10
163	1	26

Using the average concentration for empty cells can impact the EPC estimate, depending on the number of actual results and concentration distributions. If fewer than 10 results are available, the maximum concentration was used as the EPC, and this factor was considered in determining uncertainties. The following are general observations made when reviewing the results for the future industrial worker:

- Many EUs/parameters had values for all or most grids; thus, the UCL 95 is considered the best estimate of the EPC.

- Many contaminants that have significant differences in the EPC and maximum concentrations, however, make no significant contribution to the cumulative excess lifetime cancer risk (ELCR) or hazard index (HI) and/or are not chemicals of concern (COCs).

The grid averaging process described above has the potential to underestimate an EPC compared with one calculated using other protocols. Depending on the data set, this may be a UCL 95 calculated with fewer analytical values or the maximum concentration. By assuming the maximum concentration for each constituent instead of a calculated concentration, a higher ELCR or HI result is obtained. The cumulative ELCR and HI for each EU is used for the initial screening of the results to understand the uncertainty, prior to a more in depth review of the underlying data.

D2.1. EPC UNCERTAINTY FOR THE EU HAZARD INDEX

The HIs for the future industrial worker calculated using the grid based EPCs (HI-EPC) are compared to the HI calculated assuming each COPC was present at its maximum detected concentration (HI Max) (Table D2.2). These HIs are calculated using the current approach in the Risk Methods Document, and do not consider the additional uncertainties as discussed in Section D.6 for metals (DOE 2011).

There was little difference in the impacts on the decision-making process based upon the different methodology. The HIs differed generally by less than a factor of 2, with no difference at all for 13 of these pairs of estimates. Irrespective of the method of calculation, there is no impact on the decision process when both HI estimates are below the benchmark value of 1. Forty-nine of the 89 EUs had HIs < 1 using both estimates of the exposure concentration. For an additional 36 EUs, the HIs were greater than 1 for both methods.

There were three EUs where the HI calculated using the maximum concentration was greater than 1; whereas, the HI using the grid based EPC was below 1. For two of these (SWMU 14/EU 1 and SWMU 520/ EU 3), each grid had a value; thus, the UCL 95 is an appropriate methodology with which to estimate the average.

For SWMU 227/EU 1, the HI was 1.9 using the maximum concentrations and 0.6 using the EPC. This difference is attributed primarily to nickel, which had a maximum concentration of 653 mg/kg, well below the U.S. Environmental Protection Agency's Regional Screening Level of 2,000 mg/kg (HI of 0.1) for the industrial worker and would not be a COC if evaluated consistent with these screening values (EPA 2012). Therefore, it is clear that other uncertainties are critical in the interpretation of the uncertainties for noncancer hazards. This is also clear for the EUs with HI values greater than 20, where vanadium represents most of the HI, with a maximum concentration that would eliminate it as a COC using current toxicity assumptions.

The COCs identified based upon the noncancer hazards were primarily metals, and there were 10 or more results included in the calculations for over 70% of the constituents/EUs. In all cases where an individual metal had a concentration resulting in an HI > 1, there were greater than 10 results; thus, averages were

infrequently used to fill data gaps. For this reason, the EPCs, calculated using the maximums as shown on Table D2.2, likely overestimate the EPCs.

Table D2.2. Comparison of HI for RME Calculations Based on the EPC as Compared to Maximum Concentrations

SWMU	EU	HI Max	HI EPC
1	1	0.2	0.1
1	2	29.7	24.4
1	3	0	0
1	4	0.1	0.1
14	1	1.3	0.8
14	2	4.3	2.3
14	3	4.3	2.5
14	4	5.2	2.7
14	5	4	3.1
14	6	5	3.1
14	7	7.9	4.2
14	8	4.7	3
14	9	8.6	3.9
14	10	7.9	4.7
81	1	7.3	7.3
99	1	1.4	1.4
138	1	3.1	2
138	2	0.4	0.3
158	1	2	1.7
163	1	0	0
165	1	2.5	1.1
180	1	2	1.6
180	2	0.3	0.3
180	3	0.5	0.4
180	4	32.8	32.7
181	1	0.1	0.1
194	1	1	1
194	2	0.1	0.1
194	3	0.4	0.2
194	4	1.3	1.3
194	5	1.3	1.3
194	6	0.4	0.3
194	7	0.3	0.3
194	8	0.1	0
194	9	0.1	0.1
194	10	0.3	0.3
194	11	1.2	1.2
194	12	0.3	0.3
194	13	0.1	0.1
194	14	0.9	0.9
194	15	0.1	0.1
194	16	27.6	27.6
194	17	0.1	0.1
194	18	0.2	0.2
194	19	0.2	0.2
194	20	27	26.9
194	22	0.1	0
194	23	0.5	0.5
194	24	0.2	0.2
194	25	0.3	0.2
194	26	0.1	0.1
194	27	0.3	0.3
194	28	27.5	27.4
194	30	1.3	1.3
195	1	0.3	0.3
195	2	0.1	0.1
195	3	0.1	0.1
195	4	0.1	0.1
195	5	0.2	0.2
195	6	0.2	0.2
195	7	0.1	0.1
195	8	27.3	27.3
195	10	0.3	0.3
195	11	54	53.8
195	12	0.2	0.2
195	13	0.2	0.2
195	14	0.2	0.2
195	15	0	0
195	16	0.2	0.2
195	17	0.2	0.2
200	1	1.3	1
217	1	0.7	0.5
217	2	2.2	1.8
221	1	0.4	0.3
222	1	0.3	0.2
227	1	1.9	0.6
227	2	1.4	1.3
518	1	0.5	0.3
520	1	2.9	2
520	2	3.4	2
520	3	1.6	0.7
520	4	2.6	1.9
520	5	0.5	0.3
541	1	52.6	26.4
561	1	60.2	25.6
561	2	55.2	24.6
567	3	0	0
567	4	0	0

D2.2. EPC UNCERTAINTIES FOR THE ELCR

The cumulative grid based ELCR (ELCR-EPC) for the future industrial worker at each EU is compared on Table D2.3 to the estimated risk assuming each COPC was present at its maximum concentration (ELCR Max). In some cases, these values were identical; however, the ELCR-Max was typically less than a factor of 2 higher than the ELCR-EPC.

Table D2.3. Comparison of ELCR for RME Calculations Based on the EPC as compared to Maximum Concentrations

SWMU	EU	ELCR Max	ELCR EPC
1	1	2.1E-05	1.5E-05
1	2	2.0E-04	1.8E-04
1	3	3.5E-06	2.7E-06
1	4	6.9E-06	5.4E-06
14	1	2.0E-05	1.9E-05
14	2	7.9E-05	6.8E-05
14	3	7.4E-05	6.2E-05
14	4	2.2E-04	1.9E-04
14	5	1.0E-04	9.8E-05
14	6	1.0E-04	8.9E-05
14	7	9.2E-05	7.7E-05
14	8	5.1E-05	4.8E-05
14	9	1.3E-03	9.9E-04
14	10	1.1E-04	1.1E-04
81	1	2.0E-03	8.7E-04
99	1	3.8E-06	3.1E-06
138	1	2.4E-05	1.9E-05
138	2	1.2E-06	1.1E-06
153	1	4.7E-06	4.2E-06
158	1	2.8E-05	2.1E-05
163	1	6.5E-06	4.4E-06
165	1	6.5E-04	2.3E-04
180	1	1.4E-04	7.7E-05
180	2	2.2E-05	1.6E-05
180	3	3.2E-05	1.5E-05
180	4	2.2E-05	1.4E-05
181	1	1.7E-06	1.3E-06
194	1	1.3E-06	1.3E-06
194	2	2.8E-06	2.8E-06
194	3	3.1E-05	1.7E-05
194	4	3.9E-06	3.9E-06
194	5	2.7E-06	2.7E-06
194	6	2.0E-06	2.0E-06
194	7	1.8E-06	1.8E-06
194	8	1.1E-05	1.1E-05
194	9	1.6E-05	1.3E-05
194	10	2.7E-05	2.5E-05
194	11	2.9E-06	2.9E-06
194	12	1.7E-05	1.7E-05
194	13	3.1E-06	3.1E-06
194	14	1.7E-06	1.7E-06
194	15	1.8E-06	1.8E-06
194	16	2.0E-05	1.3E-05
194	17	1.9E-05	1.6E-05
194	18	1.6E-05	1.3E-05
194	19	1.4E-05	1.2E-05
194	20	1.9E-05	1.4E-05
194	22	9.8E-05	6.0E-05
194	23	2.0E-05	1.4E-05
194	24	2.1E-06	2.1E-06
194	25	2.4E-06	2.4E-06
194	26	1.4E-06	1.4E-06
194	27	1.7E-06	1.7E-06
194	28	1.7E-05	1.4E-05
194	30	1.9E-06	1.9E-06
195	1	2.1E-06	2.1E-06
195	2	2.0E-06	2.0E-06
195	3	2.4E-06	2.4E-06
195	4	1.8E-06	1.8E-06
195	5	2.3E-06	2.3E-06
195	6	5.7E-06	5.7E-06
195	7	1.6E-06	1.6E-06
195	8	2.0E-05	1.8E-05
195	10	1.5E-06	1.5E-06
195	11	2.6E-05	1.5E-05
195	12	2.5E-06	2.3E-06
195	13	2.2E-06	2.2E-06
195	14	2.0E-06	2.0E-06
195	15	1.6E-06	1.6E-06
195	16	1.5E-06	1.5E-06
195	17	1.5E-05	1.4E-05
200	1	2.9E-05	2.5E-05
217	1	3.8E-06	3.6E-06
217	2	3.7E-05	2.3E-05
221	1	2.4E-05	2.3E-05
222	1	2.6E-05	2.6E-05
227	1	1.5E-04	6.8E-05
227	2	7.4E-05	3.7E-05
518	1	1.9E-03	6.6E-04
520	1	3.0E-05	1.9E-05
520	2	1.2E-05	8.9E-06
520	3	4.3E-06	4.3E-06
520	4	1.8E-05	1.8E-05
520	5	9.2E-06	9.2E-06
541	1	3.6E-03	1.0E-03
561	1	3.4E-04	1.0E-04
561	2	1.5E-03	4.1E-04
567	3	1.3E-06	1.3E-06
567	4	1.5E-06	1.2E-06

There were 3 EUs where the ELCR-Max was more than 3 times higher than the ELCR-EPC. These EUs were AOC 541/EU1, SWMU 561/EU1, and SWMU 561/EU2. The ELCR calculated using both methods exceeded 1E-4; thus, the ELCR calculation method did not affect the final conclusion. More importantly, the COCs that represent 80–90% of the total risk (see Table D2.4) have a minimum of 14 results; thus, the ELCR-EPC is assumed to provide an accurate measure of the reasonable maximum exposure (RME).

There are instances where fewer than 10 grids had values to be used in the calculation of the UCL 95; however, in many of these cases, the EPCs were frequently at or near the maximum concentration and/or the contribution to the cumulative ELCR was not significant. The overall impact of the variation in calculation is incorporated into differences in the ELCRs as shown on Table D2.3.

Table D2.4. Risk Drivers for SWMUs with ELCR Uncertainty Greater than a Factor of 3

SWMU	EU	COPC	Units	Number Results	Number Grids	Max	EPC	ELCR Max	ELCR EPC
541	1	Uranium-238	pCi/g	18	23	4540	1000	2.7E-03	5.9E-04
541	1	PCB, Total	mg/kg	21	23	94	60.6	5.0E-04	3.2E-04
561	1	Uranium-238	pCi/g	16	32	413	107	2.4E-04	6.3E-05
561	1	Arsenic	mg/kg	16	32	33.1	16.6	3.3E-05	1.7E-05
561	2	Uranium-238	pCi/g	14	31	1340	400	7.9E-04	2.4E-04
561	2	PCB, Total	mg/kg	27	31	79	16.4	4.2E-04	8.7E-05
561	2	Total PAH	mg/kg	14	31	9.83	2.43	1.7E-04	4.1E-05

There are instances where fewer than 10 grids had values to be used in the calculation of the UCL 95; however, in many of these cases, the EPCs were frequently at or near the maximum concentration and/or the contribution to the cumulative ELCR was not significant. The overall impact of the variation in calculation is incorporated into differences in the ELCRs as shown on Table D2.3.

D2.3. CONCLUSIONS

The EPCs calculated consistent with the approach in the work plan are reasonable estimates of the RME for surface soils. The differences in the HI/ELCR using the maximum concentration as compared to the grid-based approach, as shown on Tables D2.2 and D2.3, typically are less than a factor of 2. The HI/ELCR results appear to yield accurate estimates of the RME. The use of the maximum concentrations will give somewhat higher values; however, in areas where more than 10 results were available, the EPC was often near or equal to the maximum.

The HIs generally were low except in cases where the uncertainties associated with the dermal absorption assumptions were a significant factor in the identification of COCs and the estimate of the RME concentration.

D2.4. REFERENCES

DOE (U. S. Department of Energy) 2011. *Methods for Conducting Risk Assessments and Risk Evaluations at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky,* DOE/LX/07-0107&D2/R1, February.

EPA (U.S. Environmental Protection Agency) 2012. "Regional Screening Level (RSL) Summary Table April 2012," accessed from http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/pdf/master_sl_table_run_MAY2012.pdf

ATTACHMENT D3

PROUCL OUTPUT

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General UCL Statistics for Full Data Sets

User Selected Options

From File	001-01.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Aluminum

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	7490	Minimum of Log Data	8.921
Maximum	14300	Maximum of Log Data	9.568
Mean	9751	Mean of log Data	9.174
Median	9345	SD of log Data	0.154
SD	1634		
Coefficient of Variation	0.168		
Skewness	1.746		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.853
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10525	95% H-UCL	10527
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11498
95% Adjusted-CLT UCL (Chen-1995)	10688	97.5% Chebyshev (MVUE) UCL	12256
95% Modified-t UCL (Johnson-1978)	10559	99% Chebyshev (MVUE) UCL	13745

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	34.09	Data do not follow a Discernable Distribution (0.05)	
Theta Star	286.1		
MLE of Mean	9751		
MLE of Standard Deviation	1670		
nu star	954.4		
Approximate Chi Square Value (.05)	883.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	10470
Adjusted Chi Square Value	874.7	95% Jackknife UCL	10525
		95% Standard Bootstrap UCL	10425
Anderson-Darling Test Statistic	1.13	95% Bootstrap-t UCL	11031
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	15000
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	10472
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	10738
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11655
		97.5% Chebyshev(Mean, Sd) UCL	12479
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14097
95% Approximate Gamma UCL	10532		
95% Adjusted Gamma UCL	10640		

Potential UCL to Use		
	Use 95% Student's-t UCL	10525
	or 95% Modified-t UCL	10559

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.471
Maximum	5	Maximum of Log Data	1.609
Mean	1.3	Mean of log Data	-0.126
Median	0.786	SD of log Data	0.894
SD	1.345		
Coefficient of Variation	1.035		
Skewness	2.054		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.734	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.937	95% H-UCL	2.517
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.681
95% Adjusted-CLT UCL (Chen-1995)	2.102	97.5% Chebyshev (MVUE) UCL	3.294
95% Modified-t UCL (Johnson-1978)	1.97	99% Chebyshev (MVUE) UCL	4.496

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.171	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.11		
MLE of Mean	1.3		
MLE of Standard Deviation	1.201		
nu star	32.8		
Approximate Chi Square Value (.05)	20.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.891
Adjusted Chi Square Value	19.44	95% Jackknife UCL	1.937
		95% Standard Bootstrap UCL	1.882
Anderson-Darling Test Statistic	0.52	95% Bootstrap-t UCL	2.837
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	5.071
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	1.905
Kolmogorov-Smirnov 5% Critical Value	0.233	95% BCA Bootstrap UCL	2.059
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.867
		97.5% Chebyshev(Mean, Sd) UCL	3.546
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.878
95% Approximate Gamma UCL	2.059		
95% Adjusted Gamma UCL	2.193		

Potential UCL to Use		Use 95% Approximate Gamma UCL	2.059

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	1.58	Minimum of Log Data	0.457
Maximum	10.7	Maximum of Log Data	2.37
Mean	5.406	Mean of log Data	1.545
Median	5.47	SD of log Data	0.581
SD	2.825		
Coefficient of Variation	0.523		
Skewness	0.625		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.743	95% H-UCL	7.856
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.318
95% Adjusted-CLT UCL (Chen-1995)	6.783	97.5% Chebyshev (MVUE) UCL	10.98
95% Modified-t UCL (Johnson-1978)	6.764	99% Chebyshev (MVUE) UCL	14.25

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.929	Data appear Normal at 5% Significance Level	
Theta Star	1.846		
MLE of Mean	5.406		
MLE of Standard Deviation	3.159		
nu star	82.01		
Approximate Chi Square Value (.05)	62.14	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	6.648
Adjusted Chi Square Value	59.85	95% Jackknife UCL	6.743
		95% Standard Bootstrap UCL	6.588
Anderson-Darling Test Statistic	0.297	95% Bootstrap-t UCL	6.933
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	6.965
Kolmogorov-Smirnov Test Statistic	0.14	95% Percentile Bootstrap UCL	6.679
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	6.75
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.697
		97.5% Chebyshev(Mean, Sd) UCL	10.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.92
95% Approximate Gamma UCL	7.134		
95% Adjusted Gamma UCL	7.407		

Potential UCL to Use		Use 95% Student's-t UCL	6.743

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	51.8	Minimum of Log Data	3.947
Maximum	247	Maximum of Log Data	5.509
Mean	123.7	Mean of log Data	4.749
Median	121.5	SD of log Data	0.389
SD	48.06		
Coefficient of Variation	0.389		
Skewness	1.066		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	146.4	95% H-UCL	154.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	181
95% Adjusted-CLT UCL (Chen-1995)	148.7	97.5% Chebyshev (MVUE) UCL	205.7
95% Modified-t UCL (Johnson-1978)	147	99% Chebyshev (MVUE) UCL	254.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.897	Data appear Normal at 5% Significance Level	
Theta Star	20.97		
MLE of Mean	123.7		
MLE of Standard Deviation	50.93		
nu star	165.1		
Approximate Chi Square Value (.05)	136.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	144.8
Adjusted Chi Square Value	132.9	95% Jackknife UCL	146.4
		95% Standard Bootstrap UCL	143.8
Anderson-Darling Test Statistic	0.343	95% Bootstrap-t UCL	150.1
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	160.3
Kolmogorov-Smirnov Test Statistic	0.17	95% Percentile Bootstrap UCL	144
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	146.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	179.7
		97.5% Chebyshev(Mean, Sd) UCL	203.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	251.5
95% Approximate Gamma UCL	149.7		
95% Adjusted Gamma UCL	153.6		

Potential UCL to Use		Use 95% Student's-t UCL	146.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.312	Minimum of Log Data	-1.165
Maximum	7.8	Maximum of Log Data	2.054
Mean	1.127	Mean of log Data	-0.333
Median	0.63	SD of log Data	0.73
SD	1.925		
Coefficient of Variation	1.709		
Skewness	3.71		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.361	Shapiro Wilk Test Statistic	0.621
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.038	95% H-UCL	1.515
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.734
95% Adjusted-CLT UCL (Chen-1995)	2.518	97.5% Chebyshev (MVUE) UCL	2.089
95% Modified-t UCL (Johnson-1978)	2.123	99% Chebyshev (MVUE) UCL	2.786

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.026	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.098		
MLE of Mean	1.127		
MLE of Standard Deviation	1.112		
nu star	28.74		
Approximate Chi Square Value (.05)	17.51	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.973
Adjusted Chi Square Value	16.35	95% Jackknife UCL	2.038
		95% Standard Bootstrap UCL	1.942
Anderson-Darling Test Statistic	3.056	95% Bootstrap-t UCL	10.79
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	8.052
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	2.143
Kolmogorov-Smirnov 5% Critical Value	0.234	95% BCA Bootstrap UCL	2.658
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.37
		97.5% Chebyshev(Mean, Sd) UCL	4.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.246
95% Approximate Gamma UCL	1.85		
95% Adjusted Gamma UCL	1.98		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	12
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	3.08	Maximum of Log Data	1.125
Mean	0.632	Mean of log Data	-1.531
Median	0.13	SD of log Data	1.449
SD	1.027		
Coefficient of Variation	1.625		
Skewness	1.962		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.859
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.117	95% H-UCL	2.616
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.572
95% Adjusted-CLT UCL (Chen-1995)	1.237	97.5% Chebyshev (MVUE) UCL	2.017
95% Modified-t UCL (Johnson-1978)	1.141	99% Chebyshev (MVUE) UCL	2.892
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.503	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.256		
MLE of Mean	0.632		
MLE of Standard Deviation	0.891		
nu star	14.09		
Approximate Chi Square Value (.05)	6.63	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.083
Adjusted Chi Square Value	5.964	95% Jackknife UCL	1.117
		95% Standard Bootstrap UCL	1.062
Anderson-Darling Test Statistic	1.312	95% Bootstrap-t UCL	2.042
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	2.716
Kolmogorov-Smirnov Test Statistic	0.317	95% Percentile Bootstrap UCL	1.068
Kolmogorov-Smirnov 5% Critical Value	0.24	95% BCA Bootstrap UCL	1.25
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.828
		97.5% Chebyshev(Mean, Sd) UCL	2.345
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.361
95% Approximate Gamma UCL	1.342		
95% Adjusted Gamma UCL	1.492		

Potential UCL to Use		
	Use 95% Chebyshev (Mean, Sd) UCL	1.828

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.125	Minimum of Log Data	-2.079
Maximum	0.753	Maximum of Log Data	-0.284
Mean	0.527	Mean of log Data	-0.698
Median	0.527	SD of log Data	0.415
SD	0.137		
Coefficient of Variation	0.26		
Skewness	-1.676		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.619	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.591	95% H-UCL	0.682
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.804
95% Adjusted-CLT UCL (Chen-1995)	0.569	97.5% Chebyshev (MVUE) UCL	0.919
95% Modified-t UCL (Johnson-1978)	0.589	99% Chebyshev (MVUE) UCL	1.144

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.108	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0741		
MLE of Mean	0.527		
MLE of Standard Deviation	0.198		
nu star	199		
Approximate Chi Square Value (.05)	167.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.587
Adjusted Chi Square Value	163.5	95% Jackknife UCL	0.591
		95% Standard Bootstrap UCL	0.586
Anderson-Darling Test Statistic	3.116	95% Bootstrap-t UCL	0.58
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	0.579
Kolmogorov-Smirnov Test Statistic	0.473	95% Percentile Bootstrap UCL	0.58
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	0.568
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.686
		97.5% Chebyshev(Mean, Sd) UCL	0.755
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.89
95% Approximate Gamma UCL	0.626		
95% Adjusted Gamma UCL	0.641		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.591
	or 95% Modified-t UCL	0.589

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	56.2	Maximum of Log Data	4.029
Mean	17.72	Mean of log Data	2.751
Median	14.8	SD of log Data	0.481
SD	11.62		
Coefficient of Variation	0.656		
Skewness	3.125		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.577	Shapiro Wilk Test Statistic	0.801
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	23.22	95% H-UCL	22.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.42
95% Adjusted-CLT UCL (Chen-1995)	25.6	97.5% Chebyshev (MVUE) UCL	31.75
95% Modified-t UCL (Johnson-1978)	23.66	99% Chebyshev (MVUE) UCL	40.25

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.344	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.3		
MLE of Mean	17.72		
MLE of Standard Deviation	9.691		
nu star	93.63		
Approximate Chi Square Value (.05)	72.31	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	22.83
Adjusted Chi Square Value	69.83	95% Jackknife UCL	23.22
		95% Standard Bootstrap UCL	22.83
Anderson-Darling Test Statistic	1.591	95% Bootstrap-t UCL	32.02
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	47.31
Kolmogorov-Smirnov Test Statistic	0.263	95% Percentile Bootstrap UCL	23.09
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	26.61
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.26
		97.5% Chebyshev(Mean, Sd) UCL	37.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	48.63
95% Approximate Gamma UCL	22.95		
95% Adjusted Gamma UCL	23.76		

Potential UCL to Use		
	Use 95% Student's-t UCL	23.22
	or 95% Modified-t UCL	23.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	3.79	Minimum of Log Data	1.332
Maximum	15.4	Maximum of Log Data	2.734
Mean	8.784	Mean of log Data	2.082
Median	9.045	SD of log Data	0.458
SD	3.693		
Coefficient of Variation	0.42		
Skewness	0.235		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.957	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.53	95% H-UCL	11.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.66
95% Adjusted-CLT UCL (Chen-1995)	10.47	97.5% Chebyshev (MVUE) UCL	15.75
95% Modified-t UCL (Johnson-1978)	10.54	99% Chebyshev (MVUE) UCL	19.85

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.474	Data appear Normal at 5% Significance Level	
Theta Star	1.964		
MLE of Mean	8.784		
MLE of Standard Deviation	4.153		
nu star	125.3		
Approximate Chi Square Value (.05)	100.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	10.41
Adjusted Chi Square Value	97.46	95% Jackknife UCL	10.53
		95% Standard Bootstrap UCL	10.32
Anderson-Darling Test Statistic	0.267	95% Bootstrap-t UCL	10.76
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	10.41
Kolmogorov-Smirnov Test Statistic	0.138	95% Percentile Bootstrap UCL	10.38
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	10.53
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.09
		97.5% Chebyshev(Mean, Sd) UCL	14.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.6
95% Approximate Gamma UCL	10.96		
95% Adjusted Gamma UCL	11.29		

Potential UCL to Use	Use 95% Student's-t UCL	10.53

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	254	Minimum of Log Data	5.537
Maximum	1990	Maximum of Log Data	7.596
Mean	728.7	Mean of log Data	6.402
Median	617.5	SD of log Data	0.632
SD	489.6		
Coefficient of Variation	0.672		
Skewness	1.426		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	960.4	95% H-UCL	1094
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1280
95% Adjusted-CLT UCL (Chen-1995)	997.2	97.5% Chebyshev (MVUE) UCL	1521
95% Modified-t UCL (Johnson-1978)	968.8	99% Chebyshev (MVUE) UCL	1994

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.246	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	324.4		
MLE of Mean	728.7		
MLE of Standard Deviation	486.2		
nu star	62.9		
Approximate Chi Square Value (.05)	45.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	943.9
Adjusted Chi Square Value	43.71	95% Jackknife UCL	960.4
		95% Standard Bootstrap UCL	935.7
Anderson-Darling Test Statistic	0.363	95% Bootstrap-t UCL	1047
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	1138
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	948.4
Kolmogorov-Smirnov 5% Critical Value	0.231	95% BCA Bootstrap UCL	999
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1299
		97.5% Chebyshev(Mean, Sd) UCL	1546
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2031
95% Approximate Gamma UCL	1004		
95% Adjusted Gamma UCL	1049		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1004

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0015	Minimum of Log Data	-6.516
Maximum	0.663	Maximum of Log Data	-0.411
Mean	0.23	Mean of log Data	-1.907
Median	0.23	SD of log Data	1.482
SD	0.147		
Coefficient of Variation	0.638		
Skewness	1.709		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.613	Shapiro Wilk Test Statistic	0.539
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.3	95% H-UCL	2.002
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.142
95% Adjusted-CLT UCL (Chen-1995)	0.314	97.5% Chebyshev (MVUE) UCL	1.468
95% Modified-t UCL (Johnson-1978)	0.303	99% Chebyshev (MVUE) UCL	2.109

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.053	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.219		
MLE of Mean	0.23		
MLE of Standard Deviation	0.225		
nu star	29.48		
Approximate Chi Square Value (.05)	18.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.295
Adjusted Chi Square Value	16.91	95% Jackknife UCL	0.3
		95% Standard Bootstrap UCL	0.294
Anderson-Darling Test Statistic	2.958	95% Bootstrap-t UCL	0.32
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	0.632
Kolmogorov-Smirnov Test Statistic	0.474	95% Percentile Bootstrap UCL	0.292
Kolmogorov-Smirnov 5% Critical Value	0.234	95% BCA Bootstrap UCL	0.307
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.402
		97.5% Chebyshev(Mean, Sd) UCL	0.476
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.621
95% Approximate Gamma UCL	0.376		
95% Adjusted Gamma UCL	0.402		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.402

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	7.21	Minimum of Log Data	1.975
Maximum	26.8	Maximum of Log Data	3.288
Mean	13.68	Mean of log Data	2.552
Median	12.3	SD of log Data	0.368
SD	5.232		
Coefficient of Variation	0.382		
Skewness	1.12		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.15	95% H-UCL	16.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.61
95% Adjusted-CLT UCL (Chen-1995)	16.43	97.5% Chebyshev (MVUE) UCL	22.18
95% Modified-t UCL (Johnson-1978)	16.22	99% Chebyshev (MVUE) UCL	27.23

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.362	Data appear Normal at 5% Significance Level	
Theta Star	2.15		
MLE of Mean	13.68		
MLE of Standard Deviation	5.423		
nu star	178.1		
Approximate Chi Square Value (.05)	148.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	15.98
Adjusted Chi Square Value	144.6	95% Jackknife UCL	16.15
		95% Standard Bootstrap UCL	15.91
Anderson-Darling Test Statistic	0.254	95% Bootstrap-t UCL	16.72
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	17.61
Kolmogorov-Smirnov Test Statistic	0.133	95% Percentile Bootstrap UCL	16
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	16.34
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.77
		97.5% Chebyshev(Mean, Sd) UCL	22.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27.59
95% Approximate Gamma UCL	16.43		
95% Adjusted Gamma UCL	16.84		

Potential UCL to Use		Use 95% Student's-t UCL	16.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.017	Minimum of Log Data	-4.075
Maximum	0.2	Maximum of Log Data	-1.609
Mean	0.0431	Mean of log Data	-3.723
Median	0.017	SD of log Data	0.894
SD	0.0663		
Coefficient of Variation	1.539		
Skewness	2.295		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.429	Shapiro Wilk Test Statistic	0.429
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0744	95% H-UCL	0.0691
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0736
95% Adjusted-CLT UCL (Chen-1995)	0.0838	97.5% Chebyshev (MVUE) UCL	0.0904
95% Modified-t UCL (Johnson-1978)	0.0762	99% Chebyshev (MVUE) UCL	0.123

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.833	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0517		
MLE of Mean	0.0431		
MLE of Standard Deviation	0.0472		
nu star	23.31		
Approximate Chi Square Value (.05)	13.33	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.0722
Adjusted Chi Square Value	12.33	95% Jackknife UCL	0.0744
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.293	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.531	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.235	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.12
		97.5% Chebyshev(Mean, Sd) UCL	0.154
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.219
95% Approximate Gamma UCL	0.0753		
95% Adjusted Gamma UCL	0.0814		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Plutonium-239/240

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.241	Minimum of Log Data	-1.423
Maximum	9.05	Maximum of Log Data	2.203
Mean	4.08	Mean of log Data	1.238
Median	4.08	SD of log Data	0.801
SD	1.77		
Coefficient of Variation	0.434		
Skewness	1.048		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.614	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	4.918	95% H-UCL	8.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.201
95% Adjusted-CLT UCL (Chen-1995)	5	97.5% Chebyshev (MVUE) UCL	11.18
95% Modified-t UCL (Johnson-1978)	4.94	99% Chebyshev (MVUE) UCL	15.08

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.504	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.629		
MLE of Mean	4.08		
MLE of Standard Deviation	2.578		
nu star	70.12		
Approximate Chi Square Value (.05)	51.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	4.858
Adjusted Chi Square Value	49.76	95% Jackknife UCL	4.918
		95% Standard Bootstrap UCL	4.842
Anderson-Darling Test Statistic	3.122	95% Bootstrap-t UCL	4.971
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	6.054
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	4.79
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	4.984
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.142
		97.5% Chebyshev(Mean, Sd) UCL	7.034
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.786
95% Approximate Gamma UCL	5.519		
95% Adjusted Gamma UCL	5.75		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.142

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Thallium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.116	Minimum of Log Data	-2.151
Maximum	1.56	Maximum of Log Data	0.445
Mean	0.382	Mean of log Data	-1.433
Median	0.136	SD of log Data	0.938
SD	0.438		
Coefficient of Variation	1.147		
Skewness	1.915		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.676	Shapiro Wilk Test Statistic	0.752
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.589	95% H-UCL	0.746
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.774
95% Adjusted-CLT UCL (Chen-1995)	0.638	97.5% Chebyshev (MVUE) UCL	0.955
95% Modified-t UCL (Johnson-1978)	0.599	99% Chebyshev (MVUE) UCL	1.31

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.993	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.385		
MLE of Mean	0.382		
MLE of Standard Deviation	0.383		
nu star	27.8		
Approximate Chi Square Value (.05)	16.77	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.574
Adjusted Chi Square Value	15.65	95% Jackknife UCL	0.589
		95% Standard Bootstrap UCL	0.571
Anderson-Darling Test Statistic	1.731	95% Bootstrap-t UCL	0.804
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	1.369
Kolmogorov-Smirnov Test Statistic	0.366	95% Percentile Bootstrap UCL	0.583
Kolmogorov-Smirnov 5% Critical Value	0.234	95% BCA Bootstrap UCL	0.651
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.892
		97.5% Chebyshev(Mean, Sd) UCL	1.113
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.547
95% Approximate Gamma UCL	0.633		
95% Adjusted Gamma UCL	0.679		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.892

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	1.73	Minimum of Log Data	0.548
Maximum	65	Maximum of Log Data	4.174
Mean	29.18	Mean of log Data	3.205
Median	29.18	SD of log Data	0.801
SD	12.73		
Coefficient of Variation	0.436		
Skewness	1.075		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.2	95% H-UCL	58.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.73
95% Adjusted-CLT UCL (Chen-1995)	35.82	97.5% Chebyshev (MVUE) UCL	79.89
95% Modified-t UCL (Johnson-1978)	35.36	99% Chebyshev (MVUE) UCL	107.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.499	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.68		
MLE of Mean	29.18		
MLE of Standard Deviation	18.46		
nu star	69.96		
Approximate Chi Square Value (.05)	51.71	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	34.77
Adjusted Chi Square Value	49.63	95% Jackknife UCL	35.2
		95% Standard Bootstrap UCL	34.61
Anderson-Darling Test Statistic	3.103	95% Bootstrap-t UCL	35.58
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	43.81
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	34.89
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	35.66
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	44.01
		97.5% Chebyshev(Mean, Sd) UCL	50.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	63.03
95% Approximate Gamma UCL	39.48		
95% Adjusted Gamma UCL	41.13		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	44.01

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	######	Minimum of Log Data	-7.013
Maximum	0.69	Maximum of Log Data	-0.371
Mean	0.358	Mean of log Data	-2.451
Median	0.5	SD of log Data	2.654
SD	0.279		
Coefficient of Variation	0.779		
Skewness	-0.528		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk Test Statistic	0.717
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.49	95% H-UCL	245.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.033
95% Adjusted-CLT UCL (Chen-1995)	0.469	97.5% Chebyshev (MVUE) UCL	8.04
95% Modified-t UCL (Johnson-1978)	0.488	99% Chebyshev (MVUE) UCL	11.98

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.404	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.887		
MLE of Mean	0.358		
MLE of Standard Deviation	0.564		
nu star	11.3		
Approximate Chi Square Value (.05)	4.771	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.481
Adjusted Chi Square Value	4.221	95% Jackknife UCL	0.49
		95% Standard Bootstrap UCL	0.476
Anderson-Darling Test Statistic	2.152	95% Bootstrap-t UCL	0.476
Anderson-Darling 5% Critical Value	0.802	95% Hall's Bootstrap UCL	0.46
Kolmogorov-Smirnov Test Statistic	0.409	95% Percentile Bootstrap UCL	0.477
Kolmogorov-Smirnov 5% Critical Value	0.243	95% BCA Bootstrap UCL	0.472
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.683
		97.5% Chebyshev(Mean, Sd) UCL	0.824
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.1
95% Approximate Gamma UCL	0.848		
95% Adjusted Gamma UCL	0.959		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.1

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.024	Minimum of Log Data	-3.73
Maximum	0.193	Maximum of Log Data	-1.645
Mean	0.0895	Mean of log Data	-2.492
Median	0.0895	SD of log Data	0.442
SD	0.0356		
Coefficient of Variation	0.397		
Skewness	1.54		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.625	Shapiro Wilk Test Statistic	0.642
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.106	95% H-UCL	0.117
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.138
95% Adjusted-CLT UCL (Chen-1995)	0.109	97.5% Chebyshev (MVUE) UCL	0.159
95% Modified-t UCL (Johnson-1978)	0.107	99% Chebyshev (MVUE) UCL	0.199

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.177	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0173		
MLE of Mean	0.0895		
MLE of Standard Deviation	0.0394		
nu star	145		
Approximate Chi Square Value (.05)	118.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.105
Adjusted Chi Square Value	114.9	95% Jackknife UCL	0.106
		95% Standard Bootstrap UCL	0.105
Anderson-Darling Test Statistic	2.64	95% Bootstrap-t UCL	0.11
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	0.2
Kolmogorov-Smirnov Test Statistic	0.409	95% Percentile Bootstrap UCL	0.104
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	0.109
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.131
		97.5% Chebyshev(Mean, Sd) UCL	0.149
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.184
95% Approximate Gamma UCL	0.11		
95% Adjusted Gamma UCL	0.113		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.106
	or 95% Modified-t UCL	0.107

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-238

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.894	Minimum of Log Data	-0.112
Maximum	3.31	Maximum of Log Data	1.197
Mean	1.718	Mean of log Data	0.499
Median	1.718	SD of log Data	0.302
SD	0.541		
Coefficient of Variation	0.315		
Skewness	1.714		

Warning: There are only 4 Distinct Values in this data
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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.61	Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.974	95% H-UCL	2.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.328
95% Adjusted-CLT UCL (Chen-1995)	2.026	97.5% Chebyshev (MVUE) UCL	2.592
95% Modified-t UCL (Johnson-1978)	1.985	99% Chebyshev (MVUE) UCL	3.111

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.493	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.181		
MLE of Mean	1.718		
MLE of Standard Deviation	0.557		
nu star	265.8		
Approximate Chi Square Value (.05)	229.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.955
Adjusted Chi Square Value	224.5	95% Jackknife UCL	1.974
		95% Standard Bootstrap UCL	1.957
Anderson-Darling Test Statistic	2.674	95% Bootstrap-t UCL	2.047
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	3.328
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	1.945
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.348
		97.5% Chebyshev(Mean, Sd) UCL	2.621
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.156
95% Approximate Gamma UCL	1.993		
95% Adjusted Gamma UCL	2.033		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.974
	or 95% Modified-t UCL	1.985

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	14
Raw Statistics		Log-transformed Statistics	
Minimum	17.2	Minimum of Log Data	2.845
Maximum	53.3	Maximum of Log Data	3.976
Mean	28.18	Mean of log Data	3.293
Median	24.7	SD of log Data	0.303
SD	9.458		
Coefficient of Variation	0.336		
Skewness	1.491		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.65	95% H-UCL	33.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.14
95% Adjusted-CLT UCL (Chen-1995)	33.41	97.5% Chebyshev (MVUE) UCL	42.49
95% Modified-t UCL (Johnson-1978)	32.82	99% Chebyshev (MVUE) UCL	51.02
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.857	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.182		
MLE of Mean	28.18		
MLE of Standard Deviation	9.469		
nu star	248		
Approximate Chi Square Value (.05)	212.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	32.34
Adjusted Chi Square Value	208.2	95% Jackknife UCL	32.65
		95% Standard Bootstrap UCL	32.25
Anderson-Darling Test Statistic	0.5	95% Bootstrap-t UCL	34.46
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	36.1
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	32.16
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	33.22
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.2
		97.5% Chebyshev(Mean, Sd) UCL	43.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	53.33
95% Approximate Gamma UCL	32.88		
95% Adjusted Gamma UCL	33.57		
Potential UCL to Use		Use 95% Approximate Gamma UCL	32.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options
From File 001-02.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Aluminum

General Statistics
Number of Valid Observations 12 Number of Distinct Observations 12

Raw Statistics		Log-transformed Statistics	
Minimum	7260	Minimum of Log Data	8.89
Maximum	12400	Maximum of Log Data	9.425
Mean	8464	Mean of log Data	9.035
Median	8195	SD of log Data	0.134
SD	1308		
Coefficient of Variation	0.155		
Skewness	2.831		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.645	Shapiro Wilk Test Statistic	0.715
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9142	95% H-UCL	9099
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9883
95% Adjusted-CLT UCL (Chen-1995)	9415	97.5% Chebyshev (MVUE) UCL	10499
95% Modified-t UCL (Johnson-1978)	9193	99% Chebyshev (MVUE) UCL	11711

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	41.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	202.5		
MLE of Mean	8464		
MLE of Standard Deviation	1309		
nu star	1003		
Approximate Chi Square Value (.05)	930.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9085
Adjusted Chi Square Value	919.9	95% Jackknife UCL	9142
		95% Standard Bootstrap UCL	9070
Anderson-Darling Test Statistic	1.405	95% Bootstrap-t UCL	10052
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	11769
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	9142
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	9448
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10110
		97.5% Chebyshev(Mean, Sd) UCL	10822
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12221
95% Approximate Gamma UCL	9124		
95% Adjusted Gamma UCL	9229		

Potential UCL to Use		
	Use 95% Student's-t UCL	9142
	or 95% Modified-t UCL	9193

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	3.92	Minimum of Log Data	1.366
Maximum	11.5	Maximum of Log Data	2.442
Mean	6.292	Mean of log Data	1.767
Median	5.445	SD of log Data	0.389
SD	2.584		
Coefficient of Variation	0.411		
Skewness	0.866		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.631	95% H-UCL	7.999
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.391
95% Adjusted-CLT UCL (Chen-1995)	7.718	97.5% Chebyshev (MVUE) UCL	10.74
95% Modified-t UCL (Johnson-1978)	7.663	99% Chebyshev (MVUE) UCL	13.39
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.394	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.167		
MLE of Mean	6.292		
MLE of Standard Deviation	2.709		
nu star	129.4		
Approximate Chi Square Value (.05)	104.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	7.519
Adjusted Chi Square Value	100.7	95% Jackknife UCL	7.631
		95% Standard Bootstrap UCL	7.479
Anderson-Darling Test Statistic	0.655	95% Bootstrap-t UCL	8.016
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	7.579
Kolmogorov-Smirnov Test Statistic	0.232	95% Percentile Bootstrap UCL	7.559
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	7.661
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.543
		97.5% Chebyshev(Mean, Sd) UCL	10.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.71
95% Approximate Gamma UCL	7.819		
95% Adjusted Gamma UCL	8.087		
Potential UCL to Use		Use 95% Approximate Gamma UCL	7.819

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	98.9	Minimum of Log Data	4.594
Maximum	181	Maximum of Log Data	5.198
Mean	144	Mean of log Data	4.955
Median	143.5	SD of log Data	0.183
SD	25.53		
Coefficient of Variation	0.177		
Skewness	-0.112		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Test Statistic	0.949
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	157.2	95% H-UCL	159.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	177.4
95% Adjusted-CLT UCL (Chen-1995)	155.9	97.5% Chebyshev (MVUE) UCL	191.8
95% Modified-t UCL (Johnson-1978)	157.2	99% Chebyshev (MVUE) UCL	220.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.13	Data appear Normal at 5% Significance Level	
Theta Star	5.73		
MLE of Mean	144		
MLE of Standard Deviation	28.73		
nu star	603.2		
Approximate Chi Square Value (.05)	547.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	156.1
Adjusted Chi Square Value	539.1	95% Jackknife UCL	157.2
		95% Standard Bootstrap UCL	155.5
Anderson-Darling Test Statistic	0.274	95% Bootstrap-t UCL	157.2
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	155.5
Kolmogorov-Smirnov Test Statistic	0.142	95% Percentile Bootstrap UCL	156
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	154.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	176.1
		97.5% Chebyshev(Mean, Sd) UCL	190
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	217.3
95% Approximate Gamma UCL	158.7		
95% Adjusted Gamma UCL	161.1		

Potential UCL to Use		Use 95% Student's-t UCL	157.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.258	Minimum of Log Data	-1.355
Maximum	10.5	Maximum of Log Data	2.351
Mean	1.461	Mean of log Data	-0.327
Median	0.617	SD of log Data	0.98
SD	2.865		
Coefficient of Variation	1.961		
Skewness	3.384		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.426	Shapiro Wilk Test Statistic	0.806
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.947	95% H-UCL	2.726
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.557
95% Adjusted-CLT UCL (Chen-1995)	3.685	97.5% Chebyshev (MVUE) UCL	3.185
95% Modified-t UCL (Johnson-1978)	3.081	99% Chebyshev (MVUE) UCL	4.42

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.682	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.142		
MLE of Mean	1.461		
MLE of Standard Deviation	1.769		
nu star	16.37		
Approximate Chi Square Value (.05)	8.225	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	2.822
Adjusted Chi Square Value	7.36	95% Jackknife UCL	2.947
		95% Standard Bootstrap UCL	2.737
Anderson-Darling Test Statistic	1.771	95% Bootstrap-t UCL	13.86
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	9.84
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	3.092
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	3.931
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.067
		97.5% Chebyshev(Mean, Sd) UCL	6.627
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.691
95% Approximate Gamma UCL	2.908		
95% Adjusted Gamma UCL	3.25		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	5.067

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	6.5	Maximum of Log Data	1.872
Mean	2.627	Mean of log Data	0.346
Median	2.723	SD of log Data	1.512
SD	2.144		
Coefficient of Variation	0.816		
Skewness	0.705		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Test Statistic	0.827
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.738	95% H-UCL	26.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.57
95% Adjusted-CLT UCL (Chen-1995)	3.78	97.5% Chebyshev (MVUE) UCL	14.95
95% Modified-t UCL (Johnson-1978)	3.759	99% Chebyshev (MVUE) UCL	21.59
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.759	Data appear Normal at 5% Significance Level	
Theta Star	3.46		
MLE of Mean	2.627		
MLE of Standard Deviation	3.015		
nu star	18.22		
Approximate Chi Square Value (.05)	9.553	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	3.645
Adjusted Chi Square Value	8.61	95% Jackknife UCL	3.738
		95% Standard Bootstrap UCL	3.607
Anderson-Darling Test Statistic	0.713	95% Bootstrap-t UCL	3.991
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	4.385
Kolmogorov-Smirnov Test Statistic	0.283	95% Percentile Bootstrap UCL	3.663
Kolmogorov-Smirnov 5% Critical Value	0.253	95% BCA Bootstrap UCL	3.722
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.325
		97.5% Chebyshev(Mean, Sd) UCL	6.492
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.785
95% Approximate Gamma UCL	5.011		
95% Adjusted Gamma UCL	5.56		

Potential UCL to Use	Use 95% Student's-t UCL	3.738

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	12.3	Minimum of Log Data	2.51
Maximum	258	Maximum of Log Data	5.553
Mean	37.97	Mean of log Data	3.053
Median	15.4	SD of log Data	0.853
SD	69.69		
Coefficient of Variation	1.835		
Skewness	3.395		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.402	Shapiro Wilk Test Statistic	0.614
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.1	95% H-UCL	60.33
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	62.55
95% Adjusted-CLT UCL (Chen-1995)	92.14	97.5% Chebyshev (MVUE) UCL	76.93
95% Modified-t UCL (Johnson-1978)	77.39	99% Chebyshev (MVUE) UCL	105.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.798	Data do not follow a Discernable Distribution (0.05)	
Theta Star	47.59		
MLE of Mean	37.97		
MLE of Standard Deviation	42.51		
nu star	19.15		
Approximate Chi Square Value (.05)	10.23	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	71.06
Adjusted Chi Square Value	9.247	95% Jackknife UCL	74.1
		95% Standard Bootstrap UCL	70.55
Anderson-Darling Test Statistic	2.578	95% Bootstrap-t UCL	419.1
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	356.3
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	77.26
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	96.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	125.7
		97.5% Chebyshev(Mean, Sd) UCL	163.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	238.1
95% Approximate Gamma UCL	71.1		
95% Adjusted Gamma UCL	78.64		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	125.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

cis-1,2-Dichloroethene

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.002	Minimum of Log Data	-6.215
Maximum	2400	Maximum of Log Data	7.783
Mean	241	Mean of log Data	0.81
Median	0.525	SD of log Data	3.792
SD	686.2		
Coefficient of Variation	2.848		
Skewness	3.356		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.407	Shapiro Wilk Test Statistic	0.872
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	596.7	95% H-UCL	8.7E+07
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1525
95% Adjusted-CLT UCL (Chen-1995)	771.9	97.5% Chebyshev (MVUE) UCL	2055
95% Modified-t UCL (Johnson-1978)	628.7	99% Chebyshev (MVUE) UCL	3094

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.177	Data appear Lognormal at 5% Significance Level	
Theta Star	1358		
MLE of Mean	241		
MLE of Standard Deviation	572.1		
nu star	4.258		
Approximate Chi Square Value (.05)	0.826	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	566.8
Adjusted Chi Square Value	0.626	95% Jackknife UCL	596.7
		95% Standard Bootstrap UCL	555.9
Anderson-Darling Test Statistic	1.482	95% Bootstrap-t UCL	2420
Anderson-Darling 5% Critical Value	0.878	95% Hall's Bootstrap UCL	2470
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	621.3
Kolmogorov-Smirnov 5% Critical Value	0.273	95% BCA Bootstrap UCL	820.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1104
		97.5% Chebyshev(Mean, Sd) UCL	1478
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2212
95% Approximate Gamma UCL	1242		
95% Adjusted Gamma UCL	1639		

Potential UCL to Use	Use 95% Hall's Bootstrap UCL	2470

Recommended UCL exceeds the maximum observation

In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	12.3	Minimum of Log Data	2.51
Maximum	231	Maximum of Log Data	5.442
Mean	34.35	Mean of log Data	2.984
Median	14.9	SD of log Data	0.817
SD	62.2		
Coefficient of Variation	1.811		
Skewness	3.413		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.384	Shapiro Wilk Test Statistic	0.544
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.59	95% H-UCL	52.31
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	55.49
95% Adjusted-CLT UCL (Chen-1995)	82.78	97.5% Chebyshev (MVUE) UCL	67.97
95% Modified-t UCL (Johnson-1978)	69.54	99% Chebyshev (MVUE) UCL	92.49

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.835	Data do not follow a Discernable Distribution (0.05)	
Theta Star	41.13		
MLE of Mean	34.35		
MLE of Standard Deviation	37.59		
nu star	20.04		
Approximate Chi Square Value (.05)	10.88	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	63.88
Adjusted Chi Square Value	9.865	95% Jackknife UCL	66.59
		95% Standard Bootstrap UCL	63.22
Anderson-Darling Test Statistic	2.972	95% Bootstrap-t UCL	977.5
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	386
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	69.23
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	88.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	112.6
		97.5% Chebyshev(Mean, Sd) UCL	146.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	213
95% Approximate Gamma UCL	63.26		
95% Adjusted Gamma UCL	69.77		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	112.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	158	Minimum of Log Data	5.063
Maximum	902	Maximum of Log Data	6.805
Mean	608.2	Mean of log Data	6.311
Median	687.5	SD of log Data	0.521
SD	230.2		
Coefficient of Variation	0.378		
Skewness	-0.82		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	727.6	95% H-UCL	887.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1043
95% Adjusted-CLT UCL (Chen-1995)	700.7	97.5% Chebyshev (MVUE) UCL	1224
95% Modified-t UCL (Johnson-1978)	724.9	99% Chebyshev (MVUE) UCL	1581

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.961	Data appear Normal at 5% Significance Level	
Theta Star	153.5		
MLE of Mean	608.2		
MLE of Standard Deviation	305.6		
nu star	95.07		
Approximate Chi Square Value (.05)	73.58	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	717.5
Adjusted Chi Square Value	70.7	95% Jackknife UCL	727.6
		95% Standard Bootstrap UCL	713.2
Anderson-Darling Test Statistic	0.776	95% Bootstrap-t UCL	707
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	699.2
Kolmogorov-Smirnov Test Statistic	0.225	95% Percentile Bootstrap UCL	706.1
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	697.8
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	897.8
		97.5% Chebyshev(Mean, Sd) UCL	1023
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1269
95% Approximate Gamma UCL	785.9		
95% Adjusted Gamma UCL	817.9		

Potential UCL to Use	Use 95% Student's-t UCL	727.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.0082	Minimum of Log Data	-4.804
Maximum	7.7	Maximum of Log Data	2.041
Mean	0.72	Mean of log Data	-3.098
Median	0.0258	SD of log Data	1.954
SD	2.207		
Coefficient of Variation	3.065		
Skewness	3.415		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.37	Shapiro Wilk Test Statistic	0.678
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.864	95% H-UCL	5.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.795
95% Adjusted-CLT UCL (Chen-1995)	2.439	97.5% Chebyshev (MVUE) UCL	1.045
95% Modified-t UCL (Johnson-1978)	1.969	99% Chebyshev (MVUE) UCL	1.536

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.247	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.913		
MLE of Mean	0.72		
MLE of Standard Deviation	1.448		
nu star	5.933		
Approximate Chi Square Value (.05)	1.606	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.768
Adjusted Chi Square Value	1.288	95% Jackknife UCL	1.864
		95% Standard Bootstrap UCL	1.743
Anderson-Darling Test Statistic	2.715	95% Bootstrap-t UCL	206.3
Anderson-Darling 5% Critical Value	0.842	95% Hall's Bootstrap UCL	51.92
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	1.943
Kolmogorov-Smirnov 5% Critical Value	0.268	95% BCA Bootstrap UCL	2.638
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.497
		97.5% Chebyshev(Mean, Sd) UCL	4.699
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.06
95% Approximate Gamma UCL	2.66		
95% Adjusted Gamma UCL	3.316		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	7.06

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	9.69	Minimum of Log Data	2.271
Maximum	85.4	Maximum of Log Data	4.447
Mean	24.7	Mean of log Data	3.042
Median	19.2	SD of log Data	0.53
SD	19.79		
Coefficient of Variation	0.801		
Skewness	3.053		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.581	Shapiro Wilk Test Statistic	0.854
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	34.96	95% H-UCL	34.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	40.08
95% Adjusted-CLT UCL (Chen-1995)	39.48	97.5% Chebyshev (MVUE) UCL	47.13
95% Modified-t UCL (Johnson-1978)	35.8	99% Chebyshev (MVUE) UCL	60.97

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.448	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.09		
MLE of Mean	24.7		
MLE of Standard Deviation	15.79		
nu star	58.75		
Approximate Chi Square Value (.05)	42.13	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	34.1
Adjusted Chi Square Value	39.99	95% Jackknife UCL	34.96
		95% Standard Bootstrap UCL	33.55
Anderson-Darling Test Statistic	1.098	95% Bootstrap-t UCL	55.26
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	73.05
Kolmogorov-Smirnov Test Statistic	0.281	95% Percentile Bootstrap UCL	35.62
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	41.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	49.6
		97.5% Chebyshev(Mean, Sd) UCL	60.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	81.54
95% Approximate Gamma UCL	34.44		
95% Adjusted Gamma UCL	36.29		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	49.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.017	Minimum of Log Data	-4.075
Maximum	35	Maximum of Log Data	3.555
Mean	3.424	Mean of log Data	-1.154
Median	0.239	SD of log Data	2.099
SD	9.986		
Coefficient of Variation	2.916		
Skewness	3.414		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.384	Shapiro Wilk Test Statistic	0.926
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.601	95% H-UCL	75.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.207
95% Adjusted-CLT UCL (Chen-1995)	11.2	97.5% Chebyshev (MVUE) UCL	9.514
95% Modified-t UCL (Johnson-1978)	9.075	99% Chebyshev (MVUE) UCL	14.05
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.274	Data appear Lognormal at 5% Significance Level	
Theta Star	12.52		
MLE of Mean	3.424		
MLE of Standard Deviation	6.547		
nu star	6.565		
Approximate Chi Square Value (.05)	1.935	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	8.166
Adjusted Chi Square Value	1.576	95% Jackknife UCL	8.601
		95% Standard Bootstrap UCL	7.949
Anderson-Darling Test Statistic	1.475	95% Bootstrap-t UCL	129.9
Anderson-Darling 5% Critical Value	0.828	95% Hall's Bootstrap UCL	66.09
Kolmogorov-Smirnov Test Statistic	0.32	95% Percentile Bootstrap UCL	9.003
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	12.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.99
		97.5% Chebyshev(Mean, Sd) UCL	21.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.11
95% Approximate Gamma UCL	11.62		
95% Adjusted Gamma UCL	14.26		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	32.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.08	Minimum of Log Data	-2.526
Maximum	73.9	Maximum of Log Data	4.303
Mean	11.03	Mean of log Data	-0.0102
Median	0.291	SD of log Data	2.294
SD	23.24		
Coefficient of Variation	2.107		
Skewness	2.341		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.555	Shapiro Wilk Test Statistic	0.792
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	23.07	95% H-UCL	666.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	32.51
95% Adjusted-CLT UCL (Chen-1995)	26.9	97.5% Chebyshev (MVUE) UCL	43.11
95% Modified-t UCL (Johnson-1978)	23.83	99% Chebyshev (MVUE) UCL	63.93

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.272	Data do not follow a Discernable Distribution (0.05)	
Theta Star	40.61		
MLE of Mean	11.03		
MLE of Standard Deviation	21.16		
nu star	6.517		
Approximate Chi Square Value (.05)	1.909	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	22.06
Adjusted Chi Square Value	1.554	95% Jackknife UCL	23.07
		95% Standard Bootstrap UCL	21.43
Anderson-Darling Test Statistic	1.652	95% Bootstrap-t UCL	82.65
Anderson-Darling 5% Critical Value	0.829	95% Hall's Bootstrap UCL	92.86
Kolmogorov-Smirnov Test Statistic	0.394	95% Percentile Bootstrap UCL	22.4
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	27.71
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.27
		97.5% Chebyshev(Mean, Sd) UCL	52.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	77.77
95% Approximate Gamma UCL	37.64		
95% Adjusted Gamma UCL	46.26		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	77.77
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.0053	Minimum of Log Data	-5.233
Maximum	0.6	Maximum of Log Data	-0.511
Mean	0.263	Mean of log Data	-1.761
Median	0.156	SD of log Data	1.253
SD	0.198		
Coefficient of Variation	0.752		
Skewness	0.727		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.764
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.365	95% H-UCL	1.359
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.925
95% Adjusted-CLT UCL (Chen-1995)	0.369	97.5% Chebyshev (MVUE) UCL	1.177
95% Modified-t UCL (Johnson-1978)	0.367	99% Chebyshev (MVUE) UCL	1.674

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.048	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.25		
MLE of Mean	0.263		
MLE of Standard Deviation	0.256		
nu star	25.16		
Approximate Chi Square Value (.05)	14.73	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.356
Adjusted Chi Square Value	13.53	95% Jackknife UCL	0.365
		95% Standard Bootstrap UCL	0.352
Anderson-Darling Test Statistic	0.633	95% Bootstrap-t UCL	0.381
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	0.348
Kolmogorov-Smirnov Test Statistic	0.219	95% Percentile Bootstrap UCL	0.352
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	0.361
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.511
		97.5% Chebyshev(Mean, Sd) UCL	0.619
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.83
95% Approximate Gamma UCL	0.448		
95% Adjusted Gamma UCL	0.488		

Potential UCL to Use		Use 95% Approximate Gamma UCL	0.448

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

trans-1,2-Dichloroethene

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.002	Minimum of Log Data	-6.215
Maximum	16	Maximum of Log Data	2.773
Mean	3.03	Mean of log Data	-0.209
Median	1	SD of log Data	2.355
SD	4.549		
Coefficient of Variation	1.501		
Skewness	2.44		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.68	Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.388	95% H-UCL	765.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	29.85
95% Adjusted-CLT UCL (Chen-1995)	6.178	97.5% Chebyshev (MVUE) UCL	39.63
95% Modified-t UCL (Johnson-1978)	5.543	99% Chebyshev (MVUE) UCL	58.84
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.419	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.234		
MLE of Mean	3.03		
MLE of Standard Deviation	4.682		
nu star	10.05		
Approximate Chi Square Value (.05)	3.975	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.19
Adjusted Chi Square Value	3.412	95% Jackknife UCL	5.388
		95% Standard Bootstrap UCL	5.113
Anderson-Darling Test Statistic	0.208	95% Bootstrap-t UCL	8.172
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	13.6
Kolmogorov-Smirnov Test Statistic	0.125	95% Percentile Bootstrap UCL	5.361
Kolmogorov-Smirnov 5% Critical Value	0.259	95% BCA Bootstrap UCL	6.103
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.754
		97.5% Chebyshev(Mean, Sd) UCL	11.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.1
95% Approximate Gamma UCL	7.664		
95% Adjusted Gamma UCL	8.929		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	8.929

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.001	Minimum of Log Data	-6.908
Maximum	87	Maximum of Log Data	4.466
Mean	12.64	Mean of log Data	-0.686
Median	0.45	SD of log Data	3.336
SD	27.17		
Coefficient of Variation	2.15		
Skewness	2.387		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.55	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	26.72	95% H-UCL	392386
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	130.2
95% Adjusted-CLT UCL (Chen-1995)	31.31	97.5% Chebyshev (MVUE) UCL	175
95% Modified-t UCL (Johnson-1978)	27.62	99% Chebyshev (MVUE) UCL	262.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.224	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	56.48		
MLE of Mean	12.64		
MLE of Standard Deviation	26.71		
nu star	5.37		
Approximate Chi Square Value (.05)	1.327	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	25.54
Adjusted Chi Square Value	1.048	95% Jackknife UCL	26.72
		95% Standard Bootstrap UCL	25.02
Anderson-Darling Test Statistic	0.732	95% Bootstrap-t UCL	97.83
Anderson-Darling 5% Critical Value	0.855	95% Hall's Bootstrap UCL	121.8
Kolmogorov-Smirnov Test Statistic	0.287	95% Percentile Bootstrap UCL	26.68
Kolmogorov-Smirnov 5% Critical Value	0.27	95% BCA Bootstrap UCL	31.93
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.83
		97.5% Chebyshev(Mean, Sd) UCL	61.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	90.68
95% Approximate Gamma UCL	51.14		
95% Adjusted Gamma UCL	64.78		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	64.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	19.5	Minimum of Log Data	2.97
Maximum	42.1	Maximum of Log Data	3.74
Mean	28.45	Mean of log Data	3.32
Median	27.38	SD of log Data	0.248
SD	7.149		
Coefficient of Variation	0.251		
Skewness	0.532		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.948	Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.16	95% H-UCL	32.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	37.39
95% Adjusted-CLT UCL (Chen-1995)	32.19	97.5% Chebyshev (MVUE) UCL	41.25
95% Modified-t UCL (Johnson-1978)	32.21	99% Chebyshev (MVUE) UCL	48.85

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.39	Data appear Normal at 5% Significance Level	
Theta Star	2.125		
MLE of Mean	28.45		
MLE of Standard Deviation	7.775		
nu star	321.4		
Approximate Chi Square Value (.05)	280.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	31.85
Adjusted Chi Square Value	275.1	95% Jackknife UCL	32.16
		95% Standard Bootstrap UCL	31.75
Anderson-Darling Test Statistic	0.237	95% Bootstrap-t UCL	32.36
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	32.29
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	31.77
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	31.82
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37.45
		97.5% Chebyshev(Mean, Sd) UCL	41.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	48.99
95% Approximate Gamma UCL	32.56		
95% Adjusted Gamma UCL	33.25		

Potential UCL to Use		Use 95% Student's-t UCL	32.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vinyl chloride

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6
Raw Statistics		Log-transformed Statistics	
Minimum	0.001	Minimum of Log Data	-6.908
Maximum	4.8	Maximum of Log Data	1.569
Mean	0.684	Mean of log Data	-2.192
Median	0.4	SD of log Data	2.755
SD	1.318		
Coefficient of Variation	1.927		
Skewness	3.255		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.488	Shapiro Wilk Test Statistic	0.825
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.368	95% H-UCL	1231
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.895
95% Adjusted-CLT UCL (Chen-1995)	1.692	97.5% Chebyshev (MVUE) UCL	11.89
95% Modified-t UCL (Johnson-1978)	1.427	99% Chebyshev (MVUE) UCL	17.76
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.332	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.063		
MLE of Mean	0.684		
MLE of Standard Deviation	1.188		
nu star	7.958		
Approximate Chi Square Value (.05)	2.711	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.31
Adjusted Chi Square Value	2.266	95% Jackknife UCL	1.368
		95% Standard Bootstrap UCL	1.297
Anderson-Darling Test Statistic	0.833	95% Bootstrap-t UCL	3.126
Anderson-Darling 5% Critical Value	0.811	95% Hall's Bootstrap UCL	4.252
Kolmogorov-Smirnov Test Statistic	0.271	95% Percentile Bootstrap UCL	1.427
Kolmogorov-Smirnov 5% Critical Value	0.263	95% BCA Bootstrap UCL	1.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.343
		97.5% Chebyshev(Mean, Sd) UCL	3.061
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.471
95% Approximate Gamma UCL	2.009		
95% Adjusted Gamma UCL	2.403		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	4.471

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	001-03.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.471
Maximum	0.784	Maximum of Log Data	-0.243
Mean	0.299	Mean of log Data	-1.28
Median	0.23	SD of log Data	0.35
SD	0.156		
Coefficient of Variation	0.523		
Skewness	3.191		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.482	Shapiro Wilk Test Statistic	0.583
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.38	95% H-UCL	0.364
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.425
95% Adjusted-CLT UCL (Chen-1995)	0.418	97.5% Chebyshev (MVUE) UCL	0.482
95% Modified-t UCL (Johnson-1978)	0.387	99% Chebyshev (MVUE) UCL	0.593

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.287	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0566		
MLE of Mean	0.299		
MLE of Standard Deviation	0.13		
nu star	126.9		
Approximate Chi Square Value (.05)	101.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.373
Adjusted Chi Square Value	98.45	95% Jackknife UCL	0.38
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.225	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.366	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.496
		97.5% Chebyshev(Mean, Sd) UCL	0.581
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.748
95% Approximate Gamma UCL	0.373		
95% Adjusted Gamma UCL	0.385		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.38
	or 95% Modified-t UCL	0.387

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	2.09	Minimum of Log Data	0.737
Maximum	10.5	Maximum of Log Data	2.351
Mean	5.156	Mean of log Data	1.569
Median	5.156	SD of log Data	0.398
SD	2.083		
Coefficient of Variation	0.404		
Skewness	1.372		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.236	95% H-UCL	6.626
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.786
95% Adjusted-CLT UCL (Chen-1995)	6.4	97.5% Chebyshev (MVUE) UCL	8.921
95% Modified-t UCL (Johnson-1978)	6.276	99% Chebyshev (MVUE) UCL	11.15

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.46	Data appear Normal at 5% Significance Level	
Theta Star	0.944		
MLE of Mean	5.156		
MLE of Standard Deviation	2.207		
nu star	131		
Approximate Chi Square Value (.05)	105.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.145
Adjusted Chi Square Value	102.1	95% Jackknife UCL	6.236
		95% Standard Bootstrap UCL	6.118
Anderson-Darling Test Statistic	0.503	95% Bootstrap-t UCL	6.596
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.22
Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL	6.104
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	6.396
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.777
		97.5% Chebyshev(Mean, Sd) UCL	8.911
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.14
95% Approximate Gamma UCL	6.399		
95% Adjusted Gamma UCL	6.617		

Potential UCL to Use		Use 95% Student's-t UCL	6.236

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	97	Minimum of Log Data	4.575
Maximum	197	Maximum of Log Data	5.283
Mean	119.7	Mean of log Data	4.767
Median	119.7	SD of log Data	0.189
SD	26.56		
Coefficient of Variation	0.222		
Skewness	2.484		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.684	Shapiro Wilk Test Statistic	0.77
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	133.5	95% H-UCL	132.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	148
95% Adjusted-CLT UCL (Chen-1995)	138.2	97.5% Chebyshev (MVUE) UCL	160.4
95% Modified-t UCL (Johnson-1978)	134.4	99% Chebyshev (MVUE) UCL	184.6

Gamma Distribution Test		Data Distribution
k star (bias corrected)	20.84	Data do not follow a Discernable Distribution (0.05)
Theta Star	5.743	
MLE of Mean	119.7	
MLE of Standard Deviation	26.22	
nu star	500.3	
Approximate Chi Square Value (.05)	449.4	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 132.3
Adjusted Chi Square Value	442	95% Jackknife UCL 133.5
		95% Standard Bootstrap UCL 131.8
Anderson-Darling Test Statistic	1.14	95% Bootstrap-t UCL 144.6
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL 186.8
Kolmogorov-Smirnov Test Statistic	0.301	95% Percentile Bootstrap UCL 133.3
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL 139
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 153.1
		97.5% Chebyshev(Mean, Sd) UCL 167.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 196
95% Approximate Gamma UCL	133.2	
95% Adjusted Gamma UCL	135.5	

Potential UCL to Use		
	Use 95% Student's-t UCL	133.5
	or 95% Modified-t UCL	134.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.0043	Minimum of Log Data	-5.442
Maximum	3.32	Maximum of Log Data	1.2
Mean	2.154	Mean of log Data	0.315
Median	2.162	SD of log Data	1.822
SD	0.803		
Coefficient of Variation	0.373		
Skewness	-1.667		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.801	Shapiro Wilk Test Statistic	0.414
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.571	95% H-UCL	88.86
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.06
95% Adjusted-CLT UCL (Chen-1995)	2.416	97.5% Chebyshev (MVUE) UCL	24.95
95% Modified-t UCL (Johnson-1978)	2.552	99% Chebyshev (MVUE) UCL	36.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.989	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.177		
MLE of Mean	2.154		
MLE of Standard Deviation	2.166		
nu star	23.75		
Approximate Chi Square Value (.05)	13.66	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	2.536
Adjusted Chi Square Value	12.5	95% Jackknife UCL	2.571
		95% Standard Bootstrap UCL	2.519
Anderson-Darling Test Statistic	2.923	95% Bootstrap-t UCL	2.473
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	2.471
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	2.483
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	2.431
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.165
		97.5% Chebyshev(Mean, Sd) UCL	3.602
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.461
95% Approximate Gamma UCL	3.746		
95% Adjusted Gamma UCL	4.092		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	4.461
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	153	Minimum of Log Data	5.03
Maximum	881	Maximum of Log Data	6.781
Mean	404.6	Mean of log Data	5.883
Median	404.6	SD of log Data	0.52
SD	208.4		
Coefficient of Variation	0.515		
Skewness	1.068		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	512.7	95% H-UCL	576.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	677.7
95% Adjusted-CLT UCL (Chen-1995)	523.4	97.5% Chebyshev (MVUE) UCL	795.4
95% Modified-t UCL (Johnson-1978)	515.8	99% Chebyshev (MVUE) UCL	1027
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.292	Data appear Normal at 5% Significance Level	
Theta Star	122.9		
MLE of Mean	404.6		
MLE of Standard Deviation	223		
nu star	79.01		
Approximate Chi Square Value (.05)	59.53	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	503.6
Adjusted Chi Square Value	56.96	95% Jackknife UCL	512.7
		95% Standard Bootstrap UCL	500
Anderson-Darling Test Statistic	0.483	95% Bootstrap-t UCL	538.6
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	660.2
Kolmogorov-Smirnov Test Statistic	0.231	95% Percentile Bootstrap UCL	509.7
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	520.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	666.9
		97.5% Chebyshev(Mean, Sd) UCL	780.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1003
95% Approximate Gamma UCL	537		
95% Adjusted Gamma UCL	561.3		
Potential UCL to Use		Use 95% Student's-t UCL	512.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.298	Minimum of Log Data	-1.211
Maximum	29.7	Maximum of Log Data	3.391
Mean	13.51	Mean of log Data	2.328
Median	13.51	SD of log Data	1.143
SD	6.452		
Coefficient of Variation	0.477		
Skewness	0.779		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk Test Statistic	0.518
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.86	95% H-UCL	59.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.52
95% Adjusted-CLT UCL (Chen-1995)	17.02	97.5% Chebyshev (MVUE) UCL	58.77
95% Modified-t UCL (Johnson-1978)	16.93	99% Chebyshev (MVUE) UCL	82.83

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.529	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.839		
MLE of Mean	13.51		
MLE of Standard Deviation	10.93		
nu star	36.69		
Approximate Chi Square Value (.05)	23.82	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	16.58
Adjusted Chi Square Value	22.25	95% Jackknife UCL	16.86
		95% Standard Bootstrap UCL	16.38
Anderson-Darling Test Statistic	2.11	95% Bootstrap-t UCL	17.15
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	20.4
Kolmogorov-Smirnov Test Statistic	0.398	95% Percentile Bootstrap UCL	16.45
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	16.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.63
		97.5% Chebyshev(Mean, Sd) UCL	25.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.04
95% Approximate Gamma UCL	20.81		
95% Adjusted Gamma UCL	22.28		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	21.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.017	Minimum of Log Data	-4.075
Maximum	0.365	Maximum of Log Data	-1.008
Mean	0.0757	Mean of log Data	-3.242
Median	0.017	SD of log Data	1.119
SD	0.106		
Coefficient of Variation	1.395		
Skewness	2.282		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.752
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.13	95% H-UCL	0.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.171
95% Adjusted-CLT UCL (Chen-1995)	0.147	97.5% Chebyshev (MVUE) UCL	0.215
95% Modified-t UCL (Johnson-1978)	0.134	99% Chebyshev (MVUE) UCL	0.303

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.721	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.105		
MLE of Mean	0.0757		
MLE of Standard Deviation	0.0891		
nu star	17.3		
Approximate Chi Square Value (.05)	8.889	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.126
Adjusted Chi Square Value	7.984	95% Jackknife UCL	0.13
		95% Standard Bootstrap UCL	0.124
Anderson-Darling Test Statistic	1.464	95% Bootstrap-t UCL	0.251
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	0.359
Kolmogorov-Smirnov Test Statistic	0.356	95% Percentile Bootstrap UCL	0.129
Kolmogorov-Smirnov 5% Critical Value	0.253	95% BCA Bootstrap UCL	0.144
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.208
		97.5% Chebyshev(Mean, Sd) UCL	0.266
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.379
95% Approximate Gamma UCL	0.147		
95% Adjusted Gamma UCL	0.164		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.208

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	001-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.307	Minimum of Log Data	-1.181
Maximum	1.07	Maximum of Log Data	0.0677
Mean	0.638	Mean of log Data	-0.507
Median	0.625	SD of log Data	0.361
SD	0.221		
Coefficient of Variation	0.346		
Skewness	0.493		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.752	95% H-UCL	0.798
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.934
95% Adjusted-CLT UCL (Chen-1995)	0.752	97.5% Chebyshev (MVUE) UCL	1.061
95% Modified-t UCL (Johnson-1978)	0.754	99% Chebyshev (MVUE) UCL	1.311

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.704	Data appear Normal at 5% Significance Level	
Theta Star	0.0951		
MLE of Mean	0.638		
MLE of Standard Deviation	0.246		
nu star	160.9		
Approximate Chi Square Value (.05)	132.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.743
Adjusted Chi Square Value	128.7	95% Jackknife UCL	0.752
		95% Standard Bootstrap UCL	0.74
Anderson-Darling Test Statistic	0.327	95% Bootstrap-t UCL	0.764
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.792
Kolmogorov-Smirnov Test Statistic	0.178	95% Percentile Bootstrap UCL	0.743
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	0.746
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.916
		97.5% Chebyshev(Mean, Sd) UCL	1.036
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.272
95% Approximate Gamma UCL	0.774		
95% Adjusted Gamma UCL	0.798		

Potential UCL to Use		Use 95% Student's-t UCL	0.752

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	3.35	Maximum of Log Data	1.209
Mean	1.461	Mean of log Data	-0.253
Median	1.491	SD of log Data	1.432
SD	1.204		
Coefficient of Variation	0.824		
Skewness	0.133		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.085	95% H-UCL	10.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.572
95% Adjusted-CLT UCL (Chen-1995)	2.047	97.5% Chebyshev (MVUE) UCL	7.172
95% Modified-t UCL (Johnson-1978)	2.088	99% Chebyshev (MVUE) UCL	10.31

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.747	Data appear Normal at 5% Significance Level	
Theta Star	1.956		
MLE of Mean	1.461		
MLE of Standard Deviation	1.691		
nu star	17.92		
Approximate Chi Square Value (.05)	9.336	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	2.033
Adjusted Chi Square Value	8.406	95% Jackknife UCL	2.085
		95% Standard Bootstrap UCL	2.016
Anderson-Darling Test Statistic	0.668	95% Bootstrap-t UCL	2.113
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	2.005
Kolmogorov-Smirnov Test Statistic	0.221	95% Percentile Bootstrap UCL	2.014
Kolmogorov-Smirnov 5% Critical Value	0.253	95% BCA Bootstrap UCL	2.034
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.976
		97.5% Chebyshev(Mean, Sd) UCL	3.632
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.919
95% Approximate Gamma UCL	2.805		
95% Adjusted Gamma UCL	3.116		

Potential UCL to Use		Use 95% Student's-t UCL	2.085

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cesium-137 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	12.7	Minimum of Log Data	2.542
Maximum	137	Maximum of Log Data	4.92
Mean	26.97	Mean of log Data	2.978
Median	16	SD of log Data	0.657
SD	34.93		
Coefficient of Variation	1.295		
Skewness	3.366		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.434	Shapiro Wilk Test Statistic	0.65
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	45.08	95% H-UCL	38.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	44.34
95% Adjusted-CLT UCL (Chen-1995)	54.03	97.5% Chebyshev (MVUE) UCL	53.2
95% Modified-t UCL (Johnson-1978)	46.72	99% Chebyshev (MVUE) UCL	70.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.349	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20		
MLE of Mean	26.97		
MLE of Standard Deviation	23.22		
nu star	32.37		
Approximate Chi Square Value (.05)	20.37	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	43.56
Adjusted Chi Square Value	18.93	95% Jackknife UCL	45.08
		95% Standard Bootstrap UCL	43.32
Anderson-Darling Test Statistic	2.191	95% Bootstrap-t UCL	157.9
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	109.1
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	46.68
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	57.43
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.93
		97.5% Chebyshev(Mean, Sd) UCL	89.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	127.3
95% Approximate Gamma UCL	42.87		
95% Adjusted Gamma UCL	46.14		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	70.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt-60 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	11.9	Minimum of Log Data	2.477
Maximum	63.8	Maximum of Log Data	4.156
Mean	20.85	Mean of log Data	2.922
Median	16.85	SD of log Data	0.435
SD	13.93		
Coefficient of Variation	0.668		
Skewness	3.118		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.556	Shapiro Wilk Test Statistic	0.766
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	28.07	95% H-UCL	26.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.57
95% Adjusted-CLT UCL (Chen-1995)	31.33	97.5% Chebyshev (MVUE) UCL	36.46
95% Modified-t UCL (Johnson-1978)	28.67	99% Chebyshev (MVUE) UCL	46.07

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.447	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.048		
MLE of Mean	20.85		
MLE of Standard Deviation	11.23		
nu star	82.72		
Approximate Chi Square Value (.05)	62.76	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	27.46
Adjusted Chi Square Value	60.11	95% Jackknife UCL	28.07
		95% Standard Bootstrap UCL	27.26
Anderson-Darling Test Statistic	1.39	95% Bootstrap-t UCL	45.47
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	55.17
Kolmogorov-Smirnov Test Statistic	0.271	95% Percentile Bootstrap UCL	28.43
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	32.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38.38
		97.5% Chebyshev(Mean, Sd) UCL	45.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	60.87
95% Approximate Gamma UCL	27.48		
95% Adjusted Gamma UCL	28.69		

Potential UCL to Use		
	Use 95% Student's-t UCL	28.07
	or 95% Modified-t UCL	28.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.017	Minimum of Log Data	-4.075
Maximum	0.13	Maximum of Log Data	-2.04
Mean	0.0375	Mean of log Data	-3.669
Median	0.017	SD of log Data	0.794
SD	0.0436		
Coefficient of Variation	1.161		
Skewness	1.98		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.52	Shapiro Wilk Test Statistic	0.563
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0601	95% H-UCL	0.0645
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0693
95% Adjusted-CLT UCL (Chen-1995)	0.0659	97.5% Chebyshev (MVUE) UCL	0.0847
95% Modified-t UCL (Johnson-1978)	0.0613	99% Chebyshev (MVUE) UCL	0.115

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.132	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0332		
MLE of Mean	0.0375		
MLE of Standard Deviation	0.0353		
nu star	27.16		
Approximate Chi Square Value (.05)	16.28	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.0582
Adjusted Chi Square Value	15	95% Jackknife UCL	0.0601
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.779	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0924
		97.5% Chebyshev(Mean, Sd) UCL	0.116
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.163
95% Approximate Gamma UCL	0.0627		
95% Adjusted Gamma UCL	0.068		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0924

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thorium-230 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Trichloroethene

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.005	Minimum of Log Data	-5.298
Maximum	0.6	Maximum of Log Data	-0.511
Mean	0.396	Mean of log Data	-1.258
Median	0.4	SD of log Data	1.315
SD	0.173		
Coefficient of Variation	0.438		
Skewness	-1.056		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk Test Statistic	0.544
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.485	95% H-UCL	2.722
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.687
95% Adjusted-CLT UCL (Chen-1995)	0.461	97.5% Chebyshev (MVUE) UCL	2.156
95% Modified-t UCL (Johnson-1978)	0.483	99% Chebyshev (MVUE) UCL	3.078

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.301	Data appear Normal at 5% Significance Level	
Theta Star	0.304		
MLE of Mean	0.396		
MLE of Standard Deviation	0.347		
nu star	31.23		
Approximate Chi Square Value (.05)	19.46	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.478
Adjusted Chi Square Value	18.05	95% Jackknife UCL	0.485
		95% Standard Bootstrap UCL	0.475
Anderson-Darling Test Statistic	1.668	95% Bootstrap-t UCL	0.471
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.463
Kolmogorov-Smirnov Test Statistic	0.353	95% Percentile Bootstrap UCL	0.471
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	0.458
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.613
		97.5% Chebyshev(Mean, Sd) UCL	0.708
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.893
95% Approximate Gamma UCL	0.635		
95% Adjusted Gamma UCL	0.684		

Potential UCL to Use		Use 95% Student's-t UCL	0.485

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.253	Minimum of Log Data	-1.374
Maximum	40.2	Maximum of Log Data	3.694
Mean	23.65	Mean of log Data	2.839
Median	23.78	SD of log Data	1.347
SD	9.752		
Coefficient of Variation	0.412		
Skewness	-0.824		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.906	Shapiro Wilk Test Statistic	0.492
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	28.71	95% H-UCL	181.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.7
95% Adjusted-CLT UCL (Chen-1995)	27.57	97.5% Chebyshev (MVUE) UCL	136.7
95% Modified-t UCL (Johnson-1978)	28.59	99% Chebyshev (MVUE) UCL	195.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.321	Data appear Normal at 5% Significance Level	
Theta Star	17.9		
MLE of Mean	23.65		
MLE of Standard Deviation	20.58		
nu star	31.71		
Approximate Chi Square Value (.05)	19.84	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	28.28
Adjusted Chi Square Value	18.42	95% Jackknife UCL	28.71
		95% Standard Bootstrap UCL	28.09
Anderson-Darling Test Statistic	2.014	95% Bootstrap-t UCL	28.17
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	28.31
Kolmogorov-Smirnov Test Statistic	0.405	95% Percentile Bootstrap UCL	27.88
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	27.45
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	35.92
		97.5% Chebyshev(Mean, Sd) UCL	41.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	51.66
95% Approximate Gamma UCL	37.8		
95% Adjusted Gamma UCL	40.71		

Potential UCL to Use		Use 95% Student's-t UCL	28.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	001-05.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Aluminum

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	4290	Minimum of Log Data	8.364
Maximum	12000	Maximum of Log Data	9.393
Mean	7927	Mean of log Data	8.945
Median	7927	SD of log Data	0.28
SD	2076		
Coefficient of Variation	0.262		
Skewness	0.261		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9214	95% H-UCL	9712
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11186
95% Adjusted-CLT UCL (Chen-1995)	9129	97.5% Chebyshev (MVUE) UCL	12590
95% Modified-t UCL (Johnson-1978)	9224	99% Chebyshev (MVUE) UCL	15347

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.34	Data appear Normal at 5% Significance Level	
Theta Star	766.8		
MLE of Mean	7927		
MLE of Standard Deviation	2466		
nu star	186.1		
Approximate Chi Square Value (.05)	155.5	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	9065
Adjusted Chi Square Value	149.6	95% Jackknife UCL	9214
		95% Standard Bootstrap UCL	9003
Anderson-Darling Test Statistic	0.489	95% Bootstrap-t UCL	9232
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	9559
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	8993
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	9007
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10943
		97.5% Chebyshev(Mean, Sd) UCL	12248
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14811
95% Approximate Gamma UCL	9485		
95% Adjusted Gamma UCL	9858		

Potential UCL to Use		Use 95% Student's-t UCL	9214

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	3.17	Minimum of Log Data	1.154
Maximum	16.7	Maximum of Log Data	2.815
Mean	6.613	Mean of log Data	1.758
Median	6.05	SD of log Data	0.511
SD	4.143		
Coefficient of Variation	0.627		
Skewness	2.112		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk Test Statistic	0.924
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.181	95% H-UCL	9.918
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.41
95% Adjusted-CLT UCL (Chen-1995)	9.923	97.5% Chebyshev (MVUE) UCL	13.53
95% Modified-t UCL (Johnson-1978)	9.343	99% Chebyshev (MVUE) UCL	17.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.732	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.42		
MLE of Mean	6.613		
MLE of Standard Deviation	4.001		
nu star	49.18		
Approximate Chi Square Value (.05)	34.08	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	8.885
Adjusted Chi Square Value	31.45	95% Jackknife UCL	9.181
		95% Standard Bootstrap UCL	8.764
Anderson-Darling Test Statistic	0.467	95% Bootstrap-t UCL	11.86
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	18.83
Kolmogorov-Smirnov Test Statistic	0.211	95% Percentile Bootstrap UCL	8.967
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	9.595
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.63
		97.5% Chebyshev(Mean, Sd) UCL	15.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.35
95% Approximate Gamma UCL	9.543		
95% Adjusted Gamma UCL	10.34		

Potential UCL to Use		Use 95% Approximate Gamma UCL	9.543

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	37.4	Minimum of Log Data	3.622
Maximum	215	Maximum of Log Data	5.371
Mean	118.1	Mean of log Data	4.685
Median	118.1	SD of log Data	0.475
SD	47.39		
Coefficient of Variation	0.401		
Skewness	0.509		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.891	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	147.4	95% H-UCL	175.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	203.4
95% Adjusted-CLT UCL (Chen-1995)	146.9	97.5% Chebyshev (MVUE) UCL	239.6
95% Modified-t UCL (Johnson-1978)	147.9	99% Chebyshev (MVUE) UCL	310.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.048	Data appear Normal at 5% Significance Level	
Theta Star	29.17		
MLE of Mean	118.1		
MLE of Standard Deviation	58.69		
nu star	72.86		
Approximate Chi Square Value (.05)	54.2	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	144.1
Adjusted Chi Square Value	50.83	95% Jackknife UCL	147.4
		95% Standard Bootstrap UCL	142.3
Anderson-Darling Test Statistic	0.685	95% Bootstrap-t UCL	148.6
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	162.5
Kolmogorov-Smirnov Test Statistic	0.29	95% Percentile Bootstrap UCL	144.6
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	144.2
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	186.9
		97.5% Chebyshev(Mean, Sd) UCL	216.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	275.2
95% Approximate Gamma UCL	158.7		
95% Adjusted Gamma UCL	169.3		

Potential UCL to Use			
		Use 95% Student's-t UCL	147.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.332	Minimum of Log Data	-1.1
Maximum	8.3	Maximum of Log Data	2.116
Mean	1.594	Mean of log Data	-0.18
Median	0.498	SD of log Data	1.037
SD	2.563		
Coefficient of Variation	1.608		
Skewness	2.795		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.542	Shapiro Wilk Test Statistic	0.823
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.183	95% H-UCL	4.844
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.39
95% Adjusted-CLT UCL (Chen-1995)	3.85	97.5% Chebyshev (MVUE) UCL	4.284
95% Modified-t UCL (Johnson-1978)	3.316	99% Chebyshev (MVUE) UCL	6.041

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.679	Data Follow Appr. Gamma Distribution at 5% Significance L	
Theta Star	2.347		
MLE of Mean	1.594		
MLE of Standard Deviation	1.934		
nu star	12.23		
Approximate Chi Square Value (.05)	5.378	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	3
Adjusted Chi Square Value	4.459	95% Jackknife UCL	3.183
		95% Standard Bootstrap UCL	2.909
Anderson-Darling Test Statistic	1.101	95% Bootstrap-t UCL	8.161
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	8
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	3.186
Kolmogorov-Smirnov 5% Critical Value	0.288	95% BCA Bootstrap UCL	3.943
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.318
		97.5% Chebyshev(Mean, Sd) UCL	6.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.1
95% Approximate Gamma UCL	3.625		
95% Adjusted Gamma UCL	4.373		

Potential UCL to Use		Use 95% Approximate Gamma UCL	3.625

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	1.48	Minimum of Log Data	0.392
Maximum	2.97	Maximum of Log Data	1.089
Mean	2.067	Mean of log Data	0.706
Median	2.067	SD of log Data	0.215
SD	0.448		
Coefficient of Variation	0.217		
Skewness	0.671		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.345	95% H-UCL	2.398
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.714
95% Adjusted-CLT UCL (Chen-1995)	2.349	97.5% Chebyshev (MVUE) UCL	2.994
95% Modified-t UCL (Johnson-1978)	2.351	99% Chebyshev (MVUE) UCL	3.544

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	16.43	Data appear Normal at 5% Significance Level	
Theta Star	0.126		
MLE of Mean	2.067		
MLE of Standard Deviation	0.51		
nu star	295.7		
Approximate Chi Square Value (.05)	256.8	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	2.313
Adjusted Chi Square Value	249.2	95% Jackknife UCL	2.345
		95% Standard Bootstrap UCL	2.304
Anderson-Darling Test Statistic	0.377	95% Bootstrap-t UCL	2.358
Anderson-Darling 5% Critical Value	0.721	95% Hall's Bootstrap UCL	2.488
Kolmogorov-Smirnov Test Statistic	0.191	95% Percentile Bootstrap UCL	2.312
Kolmogorov-Smirnov 5% Critical Value	0.279	95% BCA Bootstrap UCL	2.367
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.718
		97.5% Chebyshev(Mean, Sd) UCL	3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.554
95% Approximate Gamma UCL	2.38		
95% Adjusted Gamma UCL	2.453		

Potential UCL to Use			
		Use 95% Student's-t UCL	2.345

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	3.4	Minimum of Log Data	1.224
Maximum	14.3	Maximum of Log Data	2.66
Mean	6.673	Mean of log Data	1.795
Median	6.06	SD of log Data	0.463
SD	3.504		
Coefficient of Variation	0.525		
Skewness	1.521		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.845	95% H-UCL	9.606
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.13
95% Adjusted-CLT UCL (Chen-1995)	9.227	97.5% Chebyshev (MVUE) UCL	13.08
95% Modified-t UCL (Johnson-1978)	8.943	99% Chebyshev (MVUE) UCL	16.92

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.42	Data appear Normal at 5% Significance Level	
Theta Star	1.951		
MLE of Mean	6.673		
MLE of Standard Deviation	3.608		
nu star	61.56		
Approximate Chi Square Value (.05)	44.51	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	8.594
Adjusted Chi Square Value	41.47	95% Jackknife UCL	8.845
		95% Standard Bootstrap UCL	8.476
Anderson-Darling Test Statistic	0.439	95% Bootstrap-t UCL	10.98
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	19.36
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	8.68
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	8.943
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.76
		97.5% Chebyshev(Mean, Sd) UCL	13.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.29
95% Approximate Gamma UCL	9.228		
95% Adjusted Gamma UCL	9.905		

Potential UCL to Use			
		Use 95% Student's-t UCL	8.845

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	321	Minimum of Log Data	5.771
Maximum	2160	Maximum of Log Data	7.678
Mean	664	Mean of log Data	6.28
Median	384	SD of log Data	0.628
SD	587.3		
Coefficient of Variation	0.884		
Skewness	2.527		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.628	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1028	95% H-UCL	1131
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1225
95% Adjusted-CLT UCL (Chen-1995)	1162	97.5% Chebyshev (MVUE) UCL	1481
95% Modified-t UCL (Johnson-1978)	1055	99% Chebyshev (MVUE) UCL	1983

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.704	Data Follow Appr. Gamma Distribution at 5% Significance L	
Theta Star	389.8		
MLE of Mean	664		
MLE of Standard Deviation	508.7		
nu star	30.66		
Approximate Chi Square Value (.05)	19.02	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	986
Adjusted Chi Square Value	17.11	95% Jackknife UCL	1028
		95% Standard Bootstrap UCL	961.5
Anderson-Darling Test Statistic	0.976	95% Bootstrap-t UCL	1686
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	2137
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	1020
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	1183
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1517
		97.5% Chebyshev(Mean, Sd) UCL	1886
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2612
95% Approximate Gamma UCL	1071		
95% Adjusted Gamma UCL	1190		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1071

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6.79	Minimum of Log Data	1.915
Maximum	40.7	Maximum of Log Data	3.706
Mean	18.34	Mean of log Data	2.771
Median	18.34	SD of log Data	0.569
SD	10.25		
Coefficient of Variation	0.559		
Skewness	1.229		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.896	Shapiro Wilk Test Statistic	0.947
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.7	95% H-UCL	30.23
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.92
95% Adjusted-CLT UCL (Chen-1995)	25.46	97.5% Chebyshev (MVUE) UCL	40.63
95% Modified-t UCL (Johnson-1978)	24.93	99% Chebyshev (MVUE) UCL	53.82

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.594	Data appear Normal at 5% Significance Level	
Theta Star	7.073		
MLE of Mean	18.34		
MLE of Standard Deviation	11.39		
nu star	46.68		
Approximate Chi Square Value (.05)	32.01	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	23.97
Adjusted Chi Square Value	29.46	95% Jackknife UCL	24.7
		95% Standard Bootstrap UCL	23.62
Anderson-Darling Test Statistic	0.269	95% Bootstrap-t UCL	27.42
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	51.55
Kolmogorov-Smirnov Test Statistic	0.139	95% Percentile Bootstrap UCL	23.66
Kolmogorov-Smirnov 5% Critical Value	0.281	95% BCA Bootstrap UCL	24.97
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.24
		97.5% Chebyshev(Mean, Sd) UCL	39.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	52.35
95% Approximate Gamma UCL	26.76		
95% Adjusted Gamma UCL	29.07		

Potential UCL to Use			
		Use 95% Student's-t UCL	24.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.017	Minimum of Log Data	-4.08
Maximum	0.27	Maximum of Log Data	-1.31
Mean	0.074	Mean of log Data	-3.17
Median	0.017	SD of log Data	1.123
SD	0.086		
Coefficient of Variation	1.154		
Skewness	1.713		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.736	Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.128	95% H-UCL	0.319
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.193
95% Adjusted-CLT UCL (Chen-1995)	0.139	97.5% Chebyshev (MVUE) UCL	0.245
95% Modified-t UCL (Johnson-1978)	0.13	99% Chebyshev (MVUE) UCL	0.348

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.748	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.099		
MLE of Mean	0.074		
MLE of Standard Deviation	0.086		
nu star	13.46		
Approximate Chi Square Value (.05)	6.205	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	0.121
Adjusted Chi Square Value	5.203	95% Jackknife UCL	0.128
		95% Standard Bootstrap UCL	0.118
Anderson-Darling Test Statistic	0.991	95% Bootstrap-t UCL	0.166
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.144
Kolmogorov-Smirnov Test Statistic	0.354	95% Percentile Bootstrap UCL	0.124
Kolmogorov-Smirnov 5% Critical Value	0.287	95% BCA Bootstrap UCL	0.132
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.199
		97.5% Chebyshev(Mean, Sd) UCL	0.253
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.359
95% Approximate Gamma UCL	0.161		
95% Adjusted Gamma UCL	0.192		

Potential UCL to Use	0

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.088	Minimum of Log Data	-2.44
Maximum	0.33	Maximum of Log Data	-1.11
Mean	0.262	Mean of log Data	-1.44
Median	0.33	SD of log Data	0.54
SD	0.1		
Coefficient of Variation	0.382		
Skewness	-1.31		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.703	Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.324	95% H-UCL	0.425
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.483
95% Adjusted-CLT UCL (Chen-1995)	0.302	97.5% Chebyshev (MVUE) UCL	0.576
95% Modified-t UCL (Johnson-1978)	0.322	99% Chebyshev (MVUE) UCL	0.758

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.407	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.077		
MLE of Mean	0.262		
MLE of Standard Deviation	0.142		
nu star	61.32		
Approximate Chi Square Value (.05)	44.31	Nonparametric Statistics	
Adjusted Level of Significance	0.023	95% CLT UCL	0.317
Adjusted Chi Square Value	41.28	95% Jackknife UCL	0.324
		95% Standard Bootstrap UCL	0.314
Anderson-Darling Test Statistic	1.472	95% Bootstrap-t UCL	0.309
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	0.3
Kolmogorov-Smirnov Test Statistic	0.337	95% Percentile Bootstrap UCL	0.307
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	0.307
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.408
		97.5% Chebyshev(Mean, Sd) UCL	0.471
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.595
95% Approximate Gamma UCL	0.363		
95% Adjusted Gamma UCL	0.39		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.408
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	001-01.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Beryllium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.467	Minimum of Log Data	-0.761
Maximum	7.8	Maximum of Log Data	2.054
Mean	1.755	Mean of log Data	0.25
Median	1.755	SD of log Data	0.773
SD	1.837		
Coefficient of Variation	1.047		
Skewness	3.07		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.549	Shapiro Wilk Test Statistic	0.799
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.624	95% H-UCL	2.92
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.295
95% Adjusted-CLT UCL (Chen-1995)	2.993	97.5% Chebyshev (MVUE) UCL	3.99
95% Modified-t UCL (Johnson-1978)	2.691	99% Chebyshev (MVUE) UCL	5.357

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.423	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.233		
MLE of Mean	1.755		
MLE of Standard Deviation	1.471		
nu star	39.85		
Approximate Chi Square Value (.05)	26.39	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	2.562
Adjusted Chi Square Value	24.94	95% Jackknife UCL	2.624
		95% Standard Bootstrap UCL	2.532
Anderson-Darling Test Statistic	1.528	95% Bootstrap-t UCL	3.795
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	5.839
Kolmogorov-Smirnov Test Statistic	0.328	95% Percentile Bootstrap UCL	2.618
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	3.138
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.894
		97.5% Chebyshev(Mean, Sd) UCL	4.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.639
95% Approximate Gamma UCL	2.65		
95% Adjusted Gamma UCL	2.803		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.894

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	1.88	Maximum of Log Data	0.631
Mean	1.068	Mean of log Data	-0.122
Median	1.068	SD of log Data	0.873
SD	0.442		
Coefficient of Variation	0.414		
Skewness	-0.0736		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.793	Shapiro Wilk Test Statistic	0.541
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.277	95% H-UCL	2.424
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.613
95% Adjusted-CLT UCL (Chen-1995)	1.26	97.5% Chebyshev (MVUE) UCL	3.202
95% Modified-t UCL (Johnson-1978)	1.277	99% Chebyshev (MVUE) UCL	4.359

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.265	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.472		
MLE of Mean	1.068		
MLE of Standard Deviation	0.71		
nu star	63.41		
Approximate Chi Square Value (.05)	46.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.262
Adjusted Chi Square Value	44.14	95% Jackknife UCL	1.277
		95% Standard Bootstrap UCL	1.251
Anderson-Darling Test Statistic	2.174	95% Bootstrap-t UCL	1.288
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	1.371
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	1.254
Kolmogorov-Smirnov 5% Critical Value	0.231	95% BCA Bootstrap UCL	1.255
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.583
		97.5% Chebyshev(Mean, Sd) UCL	1.806
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.244
95% Approximate Gamma UCL	1.469		
95% Adjusted Gamma UCL	1.534		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	1.583

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.125	Minimum of Log Data	-2.079
Maximum	0.753	Maximum of Log Data	-0.284
Mean	0.527	Mean of log Data	-0.698
Median	0.527	SD of log Data	0.415
SD	0.137		
Coefficient of Variation	0.26		
Skewness	-1.676		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.619	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.591	95% H-UCL	0.682
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.804
95% Adjusted-CLT UCL (Chen-1995)	0.569	97.5% Chebyshev (MVUE) UCL	0.919
95% Modified-t UCL (Johnson-1978)	0.589	99% Chebyshev (MVUE) UCL	1.144

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.108	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0741		
MLE of Mean	0.527		
MLE of Standard Deviation	0.198		
nu star	199		
Approximate Chi Square Value (.05)	167.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.587
Adjusted Chi Square Value	163.5	95% Jackknife UCL	0.591
		95% Standard Bootstrap UCL	0.583
Anderson-Darling Test Statistic	3.116	95% Bootstrap-t UCL	0.58
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	0.579
Kolmogorov-Smirnov Test Statistic	0.473	95% Percentile Bootstrap UCL	0.577
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	0.572
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.686
		97.5% Chebyshev(Mean, Sd) UCL	0.755
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.89
95% Approximate Gamma UCL	0.626		
95% Adjusted Gamma UCL	0.641		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.591
	or 95% Modified-t UCL	0.589

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	4.8	Minimum of Log Data	1.569
Maximum	16.8	Maximum of Log Data	2.821
Mean	11.63	Mean of log Data	2.425
Median	11.63	SD of log Data	0.272
SD	2.499		
Coefficient of Variation	0.215		
Skewness	-0.977		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.73	Shapiro Wilk Test Statistic	0.625
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.82	95% H-UCL	13.51
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.43
95% Adjusted-CLT UCL (Chen-1995)	12.55	97.5% Chebyshev (MVUE) UCL	17.05
95% Modified-t UCL (Johnson-1978)	12.79	99% Chebyshev (MVUE) UCL	20.22

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.88	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.838		
MLE of Mean	11.63		
MLE of Standard Deviation	3.123		
nu star	388.6		
Approximate Chi Square Value (.05)	343.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	12.73
Adjusted Chi Square Value	338.3	95% Jackknife UCL	12.82
		95% Standard Bootstrap UCL	12.69
Anderson-Darling Test Statistic	2.224	95% Bootstrap-t UCL	12.61
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	12.8
Kolmogorov-Smirnov Test Statistic	0.384	95% Percentile Bootstrap UCL	12.63
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	12.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.55
		97.5% Chebyshev(Mean, Sd) UCL	15.81
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.28
95% Approximate Gamma UCL	13.15		
95% Adjusted Gamma UCL	13.36		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.82
	or 95% Modified-t UCL	12.79

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.00148	Minimum of Log Data	-6.516
Maximum	0.663	Maximum of Log Data	-0.411
Mean	0.23	Mean of log Data	-1.907
Median	0.23	SD of log Data	1.482
SD	0.147		
Coefficient of Variation	0.638		
Skewness	1.709		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.613	Shapiro Wilk Test Statistic	0.539
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.3	95% H-UCL	2.002
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.142
95% Adjusted-CLT UCL (Chen-1995)	0.314	97.5% Chebyshev (MVUE) UCL	1.468
95% Modified-t UCL (Johnson-1978)	0.303	99% Chebyshev (MVUE) UCL	2.109

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.053	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.219		
MLE of Mean	0.23		
MLE of Standard Deviation	0.225		
nu star	29.48		
Approximate Chi Square Value (.05)	18.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.295
Adjusted Chi Square Value	16.91	95% Jackknife UCL	0.3
		95% Standard Bootstrap UCL	0.294
Anderson-Darling Test Statistic	2.958	95% Bootstrap-t UCL	0.32
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	0.669
Kolmogorov-Smirnov Test Statistic	0.474	95% Percentile Bootstrap UCL	0.292
Kolmogorov-Smirnov 5% Critical Value	0.234	95% BCA Bootstrap UCL	0.309
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.402
		97.5% Chebyshev(Mean, Sd) UCL	0.476
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.621
95% Approximate Gamma UCL	0.376		
95% Adjusted Gamma UCL	0.402		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.402

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
PCB, Total

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	0.2	Maximum of Log Data	-1.609
Mean	0.158	Mean of log Data	-1.873
Median	0.13	SD of log Data	0.238
SD	0.038		
Coefficient of Variation	0.241		
Skewness	0.29		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.7	Shapiro Wilk Test Statistic	0.714
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.176	95% H-UCL	0.179
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.202
95% Adjusted-CLT UCL (Chen-1995)	0.175	97.5% Chebyshev (MVUE) UCL	0.221
95% Modified-t UCL (Johnson-1978)	0.176	99% Chebyshev (MVUE) UCL	0.258

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.95	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0106		
MLE of Mean	0.158		
MLE of Standard Deviation	0.0408		
nu star	418.6		
Approximate Chi Square Value (.05)	372.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.174
Adjusted Chi Square Value	366.4	95% Jackknife UCL	0.176
		95% Standard Bootstrap UCL	0.174
Anderson-Darling Test Statistic	2.023	95% Bootstrap-t UCL	0.177
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	0.172
Kolmogorov-Smirnov Test Statistic	0.342	95% Percentile Bootstrap UCL	0.174
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	0.174
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.202
		97.5% Chebyshev(Mean, Sd) UCL	0.221
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.259
95% Approximate Gamma UCL	0.177		
95% Adjusted Gamma UCL	0.18		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.176
	or 95% Modified-t UCL	0.176

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Plutonium-239/240

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.241	Minimum of Log Data	-1.423
Maximum	9.05	Maximum of Log Data	2.203
Mean	4.08	Mean of log Data	1.238
Median	4.08	SD of log Data	0.801
SD	1.77		
Coefficient of Variation	0.434		
Skewness	1.048		

Warning: There are only 4 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.614	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.918	95% H-UCL	8.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.201
95% Adjusted-CLT UCL (Chen-1995)	5	97.5% Chebyshev (MVUE) UCL	11.18
95% Modified-t UCL (Johnson-1978)	4.94	99% Chebyshev (MVUE) UCL	15.08

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.504	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.629		
MLE of Mean	4.08		
MLE of Standard Deviation	2.578		
nu star	70.12		
Approximate Chi Square Value (.05)	51.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	4.858
Adjusted Chi Square Value	49.76	95% Jackknife UCL	4.918
		95% Standard Bootstrap UCL	4.847
Anderson-Darling Test Statistic	3.122	95% Bootstrap-t UCL	4.971
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	6.054
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	4.871
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	4.984
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.142
		97.5% Chebyshev(Mean, Sd) UCL	7.034
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.786
95% Approximate Gamma UCL	5.519		
95% Adjusted Gamma UCL	5.75		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.142

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Thorium-230

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	1.73	Minimum of Log Data	0.548
Maximum	65	Maximum of Log Data	4.174
Mean	29.18	Mean of log Data	3.205
Median	29.18	SD of log Data	0.801
SD	12.73		
Coefficient of Variation	0.436		
Skewness	1.075		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.2	95% H-UCL	58.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.73
95% Adjusted-CLT UCL (Chen-1995)	35.82	97.5% Chebyshev (MVUE) UCL	79.89
95% Modified-t UCL (Johnson-1978)	35.36	99% Chebyshev (MVUE) UCL	107.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.499	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.68		
MLE of Mean	29.18		
MLE of Standard Deviation	18.46		
nu star	69.96		
Approximate Chi Square Value (.05)	51.71	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	34.77
Adjusted Chi Square Value	49.63	95% Jackknife UCL	35.2
		95% Standard Bootstrap UCL	34.6
Anderson-Darling Test Statistic	3.103	95% Bootstrap-t UCL	35.58
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	44.29
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	34.29
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	35.66
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	44.01
		97.5% Chebyshev(Mean, Sd) UCL	50.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	63.03
95% Approximate Gamma UCL	39.48		
95% Adjusted Gamma UCL	41.13		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	44.01

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-235

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.024	Minimum of Log Data	-3.73
Maximum	0.193	Maximum of Log Data	-1.645
Mean	0.0895	Mean of log Data	-2.492
Median	0.0895	SD of log Data	0.442
SD	0.0356		
Coefficient of Variation	0.397		
Skewness	1.54		

Warning: There are only 4 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.625	Shapiro Wilk Test Statistic	0.642
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.106	95% H-UCL	0.117
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.138
95% Adjusted-CLT UCL (Chen-1995)	0.109	97.5% Chebyshev (MVUE) UCL	0.159
95% Modified-t UCL (Johnson-1978)	0.107	99% Chebyshev (MVUE) UCL	0.199

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.177	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0173		
MLE of Mean	0.0895		
MLE of Standard Deviation	0.0394		
nu star	145		
Approximate Chi Square Value (.05)	118.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.105
Adjusted Chi Square Value	114.9	95% Jackknife UCL	0.106
		95% Standard Bootstrap UCL	0.105
Anderson-Darling Test Statistic	2.64	95% Bootstrap-t UCL	0.11
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	0.2
Kolmogorov-Smirnov Test Statistic	0.409	95% Percentile Bootstrap UCL	0.104
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	0.107
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.131
		97.5% Chebyshev(Mean, Sd) UCL	0.149
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.184
95% Approximate Gamma UCL	0.11		
95% Adjusted Gamma UCL	0.113		

Potential UCL to Use		Use 95% Student's-t UCL	0.106
		or 95% Modified-t UCL	0.107

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-238

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.894	Minimum of Log Data	-0.112
Maximum	3.31	Maximum of Log Data	1.197
Mean	1.718	Mean of log Data	0.499
Median	1.718	SD of log Data	0.302
SD	0.541		
Coefficient of Variation	0.315		
Skewness	1.714		

Warning: There are only 4 Distinct Values in this data
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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.61	Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.974	95% H-UCL	2.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.328
95% Adjusted-CLT UCL (Chen-1995)	2.026	97.5% Chebyshev (MVUE) UCL	2.592
95% Modified-t UCL (Johnson-1978)	1.985	99% Chebyshev (MVUE) UCL	3.111
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.493	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.181		
MLE of Mean	1.718		
MLE of Standard Deviation	0.557		
nu star	265.8		
Approximate Chi Square Value (.05)	229.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	1.955
Adjusted Chi Square Value	224.5	95% Jackknife UCL	1.974
		95% Standard Bootstrap UCL	1.949
Anderson-Darling Test Statistic	2.674	95% Bootstrap-t UCL	2.047
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	3.328
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	1.945
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	1.949
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.348
		97.5% Chebyshev(Mean, Sd) UCL	2.621
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.156
95% Approximate Gamma UCL	1.993		
95% Adjusted Gamma UCL	2.033		

Potential UCL to Use	Use 95% Student's-t UCL	1.974
	or 95% Modified-t UCL	1.985

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	001-02.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.7	Minimum of Log Data	-0.357
Maximum	10.5	Maximum of Log Data	2.351
Mean	5.6	Mean of log Data	1.602
Median	5.6	SD of log Data	0.643
SD	2.089		
Coefficient of Variation	0.373		
Skewness	-2.21E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.484
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.683	95% H-UCL	9.583
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.99
95% Adjusted-CLT UCL (Chen-1995)	6.592	97.5% Chebyshev (MVUE) UCL	13.16
95% Modified-t UCL (Johnson-1978)	6.683	99% Chebyshev (MVUE) UCL	17.42

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.277	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.709		
MLE of Mean	5.6		
MLE of Standard Deviation	3.094		
nu star	78.65		
Approximate Chi Square Value (.05)	59.22	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.592
Adjusted Chi Square Value	56.65	95% Jackknife UCL	6.683
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.942	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.229
		97.5% Chebyshev(Mean, Sd) UCL	9.367
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.6
95% Approximate Gamma UCL	7.438		
95% Adjusted Gamma UCL	7.775		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	8.229

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	6.5	Maximum of Log Data	1.872
Mean	6.45	Mean of log Data	1.864
Median	6.45	SD of log Data	0.00331
SD	0.0213		
Coefficient of Variation	0.00331		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.6
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.461	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.477
95% Adjusted-CLT UCL (Chen-1995)	6.46	97.5% Chebyshev (MVUE) UCL	6.488
95% Modified-t UCL (Johnson-1978)	6.461	99% Chebyshev (MVUE) UCL	6.511

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	74882	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.61E-05		
MLE of Mean	6.45		
MLE of Standard Deviation	0.0236		
nu star	1797178		
Approximate Chi Square Value (.05)	1794061	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.46
Adjusted Chi Square Value	1793585	95% Jackknife UCL	6.461
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	10.99	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.791	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.477
		97.5% Chebyshev(Mean, Sd) UCL	6.488
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.511
95% Approximate Gamma UCL	6.461		
95% Adjusted Gamma UCL	6.463		

Potential UCL to Use		
	Use 95% Student's-t UCL	6.461
	or 95% Modified-t UCL	6.461

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	12.8	Minimum of Log Data	2.549
Maximum	258	Maximum of Log Data	5.553
Mean	135.4	Mean of log Data	4.765
Median	135.4	SD of log Data	0.722
SD	52.28		
Coefficient of Variation	0.386		
Skewness	-5.33E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.472
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	162.5	95% H-UCL	259.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	289.2
95% Adjusted-CLT UCL (Chen-1995)	160.2	97.5% Chebyshev (MVUE) UCL	350.1
95% Modified-t UCL (Johnson-1978)	162.5	99% Chebyshev (MVUE) UCL	469.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	48.36		
MLE of Mean	135.4		
MLE of Standard Deviation	80.92		
nu star	67.19		
Approximate Chi Square Value (.05)	49.33	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	160.2
Adjusted Chi Square Value	47	95% Jackknife UCL	162.5
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.983	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.486	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	201.2
		97.5% Chebyshev(Mean, Sd) UCL	229.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	285.6
95% Approximate Gamma UCL	184.4		
95% Adjusted Gamma UCL	193.6		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	201.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	14.8	Minimum of Log Data	2.695
Maximum	231	Maximum of Log Data	5.442
Mean	122.9	Mean of log Data	4.688
Median	122.9	SD of log Data	0.653
SD	46.09		
Coefficient of Variation	0.375		
Skewness	5.19E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.482
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	146.8	95% H-UCL	213.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	244
95% Adjusted-CLT UCL (Chen-1995)	144.8	97.5% Chebyshev (MVUE) UCL	292.6
95% Modified-t UCL (Johnson-1978)	146.8	99% Chebyshev (MVUE) UCL	388

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.204	Data do not follow a Discernable Distribution (0.05)	
Theta Star	38.36		
MLE of Mean	122.9		
MLE of Standard Deviation	68.66		
nu star	76.9		
Approximate Chi Square Value (.05)	57.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	144.8
Adjusted Chi Square Value	55.17	95% Jackknife UCL	146.8
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.948	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.482	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	180.9
		97.5% Chebyshev(Mean, Sd) UCL	206
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	255.3
95% Approximate Gamma UCL	163.8		
95% Adjusted Gamma UCL	171.3		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	180.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	7.7	Maximum of Log Data	2.041
Mean	3.9	Mean of log Data	1.112
Median	3.9	SD of log Data	1.093
SD	1.62		
Coefficient of Variation	0.415		
Skewness	5.47E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.43
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.74	95% H-UCL	15.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.78
95% Adjusted-CLT UCL (Chen-1995)	4.669	97.5% Chebyshev (MVUE) UCL	16.07
95% Modified-t UCL (Johnson-1978)	4.74	99% Chebyshev (MVUE) UCL	22.56

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.678	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.324		
MLE of Mean	3.9		
MLE of Standard Deviation	3.011		
nu star	40.27		
Approximate Chi Square Value (.05)	26.73	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	4.669
Adjusted Chi Square Value	25.06	95% Jackknife UCL	4.74
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.173	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.939
		97.5% Chebyshev(Mean, Sd) UCL	6.821
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.554
95% Approximate Gamma UCL	5.876		
95% Adjusted Gamma UCL	6.268		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.939

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	13.7	Minimum of Log Data	2.617
Maximum	85.4	Maximum of Log Data	4.447
Mean	49.55	Mean of log Data	3.841
Median	49.55	SD of log Data	0.416
SD	15.29		
Coefficient of Variation	0.309		
Skewness	-8.89E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.527
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.47	95% H-UCL	65.63
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.23
95% Adjusted-CLT UCL (Chen-1995)	56.81	97.5% Chebyshev (MVUE) UCL	88.84
95% Modified-t UCL (Johnson-1978)	57.47	99% Chebyshev (MVUE) UCL	111.6

Gamma Distribution Test		Data Distribution
k star (bias corrected)	6.249	Data do not follow a Discernable Distribution (0.05)
Theta Star	7.929	
MLE of Mean	49.55	
MLE of Standard Deviation	19.82	
nu star	150	
Approximate Chi Square Value (.05)	122.7	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 56.81
Adjusted Chi Square Value	118.9	95% Jackknife UCL 57.47
		95% Standard Bootstrap UCL N/A
Anderson-Darling Test Statistic	2.83	95% Bootstrap-t UCL N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL N/A
Kolmogorov-Smirnov Test Statistic	0.463	95% Percentile Bootstrap UCL N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 68.79
		97.5% Chebyshev(Mean, Sd) UCL 77.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 93.46
95% Approximate Gamma UCL	60.58	
95% Adjusted Gamma UCL	62.5	

Potential UCL to Use		
	Use 95% Student's-t UCL	57.47
	or 95% Modified-t UCL	57.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.13	Minimum of Log Data	-2.04
Maximum	35	Maximum of Log Data	3.555
Mean	3.443	Mean of log Data	-0.815
Median	0.239	SD of log Data	1.694
SD	9.979		
Coefficient of Variation	2.898		
Skewness	3.415		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.381	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.616	95% H-UCL	16.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.934
95% Adjusted-CLT UCL (Chen-1995)	11.22	97.5% Chebyshev (MVUE) UCL	6.429
95% Modified-t UCL (Johnson-1978)	9.09	99% Chebyshev (MVUE) UCL	9.365

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.304	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.34		
MLE of Mean	3.443		
MLE of Standard Deviation	6.248		
nu star	7.288		
Approximate Chi Square Value (.05)	2.33	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	8.181
Adjusted Chi Square Value	1.926	95% Jackknife UCL	8.616
		95% Standard Bootstrap UCL	7.886
Anderson-Darling Test Statistic	2.141	95% Bootstrap-t UCL	145.1
Anderson-Darling 5% Critical Value	0.818	95% Hall's Bootstrap UCL	76.07
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	9.006
Kolmogorov-Smirnov 5% Critical Value	0.264	95% BCA Bootstrap UCL	12.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16
		97.5% Chebyshev(Mean, Sd) UCL	21.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.11
95% Approximate Gamma UCL	10.77		
95% Adjusted Gamma UCL	13.03		

Potential UCL to Use		
	Use 99% Chebyshev (Mean, Sd) UCL	32.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	2.1	Minimum of Log Data	0.742
Maximum	42.5	Maximum of Log Data	3.75
Mean	22.3	Mean of log Data	2.961
Median	22.3	SD of log Data	0.723
SD	8.613		
Coefficient of Variation	0.386		
Skewness	0		

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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.471
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	26.77	95% H-UCL	42.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	47.69
95% Adjusted-CLT UCL (Chen-1995)	26.39	97.5% Chebyshev (MVUE) UCL	57.74
95% Modified-t UCL (Johnson-1978)	26.77	99% Chebyshev (MVUE) UCL	77.49

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.794	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.981		
MLE of Mean	22.3		
MLE of Standard Deviation	13.34		
nu star	67.06		
Approximate Chi Square Value (.05)	49.21	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	26.39
Adjusted Chi Square Value	46.88	95% Jackknife UCL	26.77
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.984	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.486	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.14
		97.5% Chebyshev(Mean, Sd) UCL	37.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	47.04
95% Approximate Gamma UCL	30.39		
95% Adjusted Gamma UCL	31.89		

Potential UCL to Use		
	Use 95% Chebyshev (Mean, Sd) UCL	33.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.37	Minimum of Log Data	-0.994
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.535	Mean of log Data	-0.634
Median	0.535	SD of log Data	0.137
SD	0.0704		
Coefficient of Variation	0.132		
Skewness	-2.99E-15		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.587
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.571	95% H-UCL	0.577
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.628
95% Adjusted-CLT UCL (Chen-1995)	0.568	97.5% Chebyshev (MVUE) UCL	0.668
95% Modified-t UCL (Johnson-1978)	0.571	99% Chebyshev (MVUE) UCL	0.747

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	45.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0118		
MLE of Mean	0.535		
MLE of Standard Deviation	0.0796		
nu star	1085		
Approximate Chi Square Value (.05)	1009	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.568
Adjusted Chi Square Value	998.3	95% Jackknife UCL	0.571
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.729	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.434	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.624
		97.5% Chebyshev(Mean, Sd) UCL	0.662
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.737
95% Approximate Gamma UCL	0.575		
95% Adjusted Gamma UCL	0.581		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.571
	or 95% Modified-t UCL	0.571

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	23.5	Minimum of Log Data	3.157
Maximum	42.1	Maximum of Log Data	3.74
Mean	32.8	Mean of log Data	3.483
Median	32.8	SD of log Data	0.125
SD	3.966		
Coefficient of Variation	0.121		
Skewness	-3.18E-15		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.589
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	34.86	95% H-UCL	35.13
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	37.99
95% Adjusted-CLT UCL (Chen-1995)	34.68	97.5% Chebyshev (MVUE) UCL	40.23
95% Modified-t UCL (Johnson-1978)	34.86	99% Chebyshev (MVUE) UCL	44.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	53.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.609		
MLE of Mean	32.8		
MLE of Standard Deviation	4.469		
nu star	1293		
Approximate Chi Square Value (.05)	1210	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	34.68
Adjusted Chi Square Value	1198	95% Jackknife UCL	34.86
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.727	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37.79
		97.5% Chebyshev(Mean, Sd) UCL	39.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	44.19
95% Approximate Gamma UCL	35.04		
95% Adjusted Gamma UCL	35.39		

Potential UCL to Use		
	Use 95% Student's-t UCL	34.86
	or 95% Modified-t UCL	34.86

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	001-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	11.8	Minimum of Log Data	2.468
Maximum	17.1	Maximum of Log Data	2.839
Mean	13.83	Mean of log Data	2.623
Median	13.83	SD of log Data	0.0875
SD	1.251		
Coefficient of Variation	0.091		
Skewness	1.297		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.711	Shapiro Wilk Test Statistic	0.734
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.47	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.35
95% Adjusted-CLT UCL (Chen-1995)	14.56	97.5% Chebyshev (MVUE) UCL	16.01
95% Modified-t UCL (Johnson-1978)	14.5	99% Chebyshev (MVUE) UCL	17.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	104.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.132		
MLE of Mean	13.83		
MLE of Standard Deviation	1.35		
nu star	2518		
Approximate Chi Square Value (.05)	2403	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	14.42
Adjusted Chi Square Value	2385	95% Jackknife UCL	14.47
		95% Standard Bootstrap UCL	14.39
Anderson-Darling Test Statistic	1.786	95% Bootstrap-t UCL	14.57
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	15.71
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	14.39
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	14.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.4
		97.5% Chebyshev(Mean, Sd) UCL	16.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.42
95% Approximate Gamma UCL	14.49		
95% Adjusted Gamma UCL	14.59		

Potential UCL to Use		
	Use 95% Student's-t UCL	14.47
	or 95% Modified-t UCL	14.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	0.365	Maximum of Log Data	-1.008
Mean	0.182	Mean of log Data	-1.759
Median	0.182	SD of log Data	0.343
SD	0.068		
Coefficient of Variation	0.371		
Skewness	1.732		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Test Statistic	0.831
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.217	95% H-UCL	0.224
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.261
95% Adjusted-CLT UCL (Chen-1995)	0.224	97.5% Chebyshev (MVUE) UCL	0.295
95% Modified-t UCL (Johnson-1978)	0.219	99% Chebyshev (MVUE) UCL	0.363

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.948	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.026		
MLE of Mean	0.182		
MLE of Standard Deviation	0.069		
nu star	166.7		
Approximate Chi Square Value (.05)	137.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.214
Adjusted Chi Square Value	133.9	95% Jackknife UCL	0.217
		95% Standard Bootstrap UCL	0.213
Anderson-Darling Test Statistic	1.124	95% Bootstrap-t UCL	0.227
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.386
Kolmogorov-Smirnov Test Statistic	0.294	95% Percentile Bootstrap UCL	0.218
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.225
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.267
		97.5% Chebyshev(Mean, Sd) UCL	0.304
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.376
95% Approximate Gamma UCL	0.22		
95% Adjusted Gamma UCL	0.227		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.217
	or 95% Modified-t UCL	0.219

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	001-04.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.449	Minimum of Log Data	-0.801
Maximum	0.95	Maximum of Log Data	-0.0513
Mean	0.669	Mean of log Data	-0.414
Median	0.669	SD of log Data	0.162
SD	0.109		
Coefficient of Variation	0.163		
Skewness	0.957		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.662	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.725	95% H-UCL	0.732
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.806
95% Adjusted-CLT UCL (Chen-1995)	0.73	97.5% Chebyshev (MVUE) UCL	0.865
95% Modified-t UCL (Johnson-1978)	0.727	99% Chebyshev (MVUE) UCL	0.981

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	31.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0213		
MLE of Mean	0.669		
MLE of Standard Deviation	0.119		
nu star	755.1		
Approximate Chi Square Value (.05)	692.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.721
Adjusted Chi Square Value	683.2	95% Jackknife UCL	0.725
		95% Standard Bootstrap UCL	0.719
Anderson-Darling Test Statistic	2.171	95% Bootstrap-t UCL	0.73
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	0.799
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	0.716
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.721
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.806
		97.5% Chebyshev(Mean, Sd) UCL	0.866
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.982
95% Approximate Gamma UCL	0.729		
95% Adjusted Gamma UCL	0.739		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.725
	or 95% Modified-t UCL	0.727

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	12.4	Minimum of Log Data	2.518
Maximum	137	Maximum of Log Data	4.92
Mean	54.83	Mean of log Data	3.849
Median	54.83	SD of log Data	0.634
SD	30.35		
Coefficient of Variation	0.553		
Skewness	1.622		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.655	Shapiro Wilk Test Statistic	0.688
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.57	95% H-UCL	89.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.9
95% Adjusted-CLT UCL (Chen-1995)	73.63	97.5% Chebyshev (MVUE) UCL	123
95% Modified-t UCL (Johnson-1978)	71.25	99% Chebyshev (MVUE) UCL	162.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.592	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.15		
MLE of Mean	54.83		
MLE of Standard Deviation	34.06		
nu star	62.22		
Approximate Chi Square Value (.05)	45.07	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.24
Adjusted Chi Square Value	42.86	95% Jackknife UCL	70.57
		95% Standard Bootstrap UCL	69.01
Anderson-Darling Test Statistic	2.064	95% Bootstrap-t UCL	75.36
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	143.8
Kolmogorov-Smirnov Test Statistic	0.406	95% Percentile Bootstrap UCL	68.53
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	75.38
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	93.02
		97.5% Chebyshev(Mean, Sd) UCL	109.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	142
95% Approximate Gamma UCL	75.69		
95% Adjusted Gamma UCL	79.61		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	93.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt-60 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	4.95	Minimum of Log Data	1.599
Maximum	63.8	Maximum of Log Data	4.156
Mean	30.72	Mean of log Data	3.311
Median	30.72	SD of log Data	0.587
SD	12.83		
Coefficient of Variation	0.418		
Skewness	0.966		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.663	Shapiro Wilk Test Statistic	0.587
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	37.37	95% H-UCL	48.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	56.42
95% Adjusted-CLT UCL (Chen-1995)	37.91	97.5% Chebyshev (MVUE) UCL	66.97
95% Modified-t UCL (Johnson-1978)	37.54	99% Chebyshev (MVUE) UCL	87.69

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.469	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.856		
MLE of Mean	30.72		
MLE of Standard Deviation	16.49		
nu star	83.25		
Approximate Chi Square Value (.05)	63.22	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	36.81
Adjusted Chi Square Value	60.56	95% Jackknife UCL	37.37
		95% Standard Bootstrap UCL	36.65
Anderson-Darling Test Statistic	2.3	95% Bootstrap-t UCL	37.89
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	46.15
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	36.23
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	36.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.87
		97.5% Chebyshev(Mean, Sd) UCL	53.85
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	67.58
95% Approximate Gamma UCL	40.45		
95% Adjusted Gamma UCL	42.22		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	46.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.13	Minimum of Log Data	-2.04
Maximum	8.5	Maximum of Log Data	2.14
Mean	1.055	Mean of log Data	-1.053
Median	0.2	SD of log Data	1.291
SD	2.371		
Coefficient of Variation	2.247		
Skewness	3.332		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.765
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.284	95% H-UCL	3.096
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.992
95% Adjusted-CLT UCL (Chen-1995)	2.884	97.5% Chebyshev (MVUE) UCL	2.543
95% Modified-t UCL (Johnson-1978)	2.394	99% Chebyshev (MVUE) UCL	3.624
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.478	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.205		
MLE of Mean	1.055		
MLE of Standard Deviation	1.525		
nu star	11.48		
Approximate Chi Square Value (.05)	4.887	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	2.181
Adjusted Chi Square Value	4.249	95% Jackknife UCL	2.284
		95% Standard Bootstrap UCL	2.159
Anderson-Darling Test Statistic	1.775	95% Bootstrap-t UCL	7.461
Anderson-Darling 5% Critical Value	0.78	95% Hall's Bootstrap UCL	6.407
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	2.373
Kolmogorov-Smirnov 5% Critical Value	0.258	95% BCA Bootstrap UCL	3.148
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.038
		97.5% Chebyshev(Mean, Sd) UCL	5.329
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.865
95% Approximate Gamma UCL	2.478		
95% Adjusted Gamma UCL	2.85		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	4.038

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thorium-230 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	001-05.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Beryllium

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.488	Minimum of Log Data	-0.717
Maximum	8.3	Maximum of Log Data	2.116
Mean	2.475	Mean of log Data	0.527
Median	2.475	SD of log Data	0.957
SD	2.378		
Coefficient of Variation	0.961		
Skewness	2.098		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.695	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.949	95% H-UCL	7.755
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.111
95% Adjusted-CLT UCL (Chen-1995)	4.371	97.5% Chebyshev (MVUE) UCL	7.671
95% Modified-t UCL (Johnson-1978)	4.041	99% Chebyshev (MVUE) UCL	10.73

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.049	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2.358		
MLE of Mean	2.475		
MLE of Standard Deviation	2.416		
nu star	18.89		
Approximate Chi Square Value (.05)	10.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	3.779
Adjusted Chi Square Value	8.709	95% Jackknife UCL	3.949
		95% Standard Bootstrap UCL	3.701
Anderson-Darling Test Statistic	0.858	95% Bootstrap-t UCL	4.98
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	9.278
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	3.769
Kolmogorov-Smirnov 5% Critical Value	0.284	95% BCA Bootstrap UCL	4.21
Data follow Appr. Gamma Distribution at 5% Significan		95% Chebyshev(Mean, Sd) UCL	5.93
		97.5% Chebyshev(Mean, Sd) UCL	7.426
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.36
95% Approximate Gamma UCL	4.657		
95% Adjusted Gamma UCL	5.368		

Potential UCL to Use			
		Use 95% Approximate Gamma UCL	4.657

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	1.95	Maximum of Log Data	0.668
Mean	0.812	Mean of log Data	-0.692
Median	0.812	SD of log Data	1.351
SD	0.571		
Coefficient of Variation	0.704		
Skewness	0.555		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.854	Shapiro Wilk Test Statistic	0.705
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.166	95% H-UCL	8.701
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.235
95% Adjusted-CLT UCL (Chen-1995)	1.163	97.5% Chebyshev (MVUE) UCL	4.173
95% Modified-t UCL (Johnson-1978)	1.172	99% Chebyshev (MVUE) UCL	6.017

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.856	Data appear Normal at 5% Significance Level	
Theta Star	0.949		
MLE of Mean	0.812		
MLE of Standard Deviation	0.878		
nu star	15.4		
Approximate Chi Square Value (.05)	7.543	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	1.125
Adjusted Chi Square Value	6.418	95% Jackknife UCL	1.166
		95% Standard Bootstrap UCL	1.105
Anderson-Darling Test Statistic	1.179	95% Bootstrap-t UCL	1.193
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1.384
Kolmogorov-Smirnov Test Statistic	0.4	95% Percentile Bootstrap UCL	1.15
Kolmogorov-Smirnov 5% Critical Value	0.286	95% BCA Bootstrap UCL	1.109
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.642
		97.5% Chebyshev(Mean, Sd) UCL	2.001
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.706
95% Approximate Gamma UCL	1.658		
95% Adjusted Gamma UCL	1.949		

Potential UCL to Use		Use 95% Student's-t UCL	1.166

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	7.22	Minimum of Log Data	1.977
Maximum	40.7	Maximum of Log Data	3.706
Mean	20.11	Mean of log Data	2.918
Median	20.11	SD of log Data	0.444
SD	8.804		
Coefficient of Variation	0.438		
Skewness	1.526		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.763	Shapiro Wilk Test Statistic	0.812
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.56	95% H-UCL	28.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.35
95% Adjusted-CLT UCL (Chen-1995)	26.53	97.5% Chebyshev (MVUE) UCL	39.05
95% Modified-t UCL (Johnson-1978)	25.81	99% Chebyshev (MVUE) UCL	50.25

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.21	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.776		
MLE of Mean	20.11		
MLE of Standard Deviation	9.799		
nu star	75.77		
Approximate Chi Square Value (.05)	56.72	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	24.93
Adjusted Chi Square Value	53.26	95% Jackknife UCL	25.56
		95% Standard Bootstrap UCL	24.62
Anderson-Darling Test Statistic	0.975	95% Bootstrap-t UCL	27.65
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	52.56
Kolmogorov-Smirnov Test Statistic	0.335	95% Percentile Bootstrap UCL	24.68
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	26.06
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	32.9
		97.5% Chebyshev(Mean, Sd) UCL	38.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	49.3
95% Approximate Gamma UCL	26.86		
95% Adjusted Gamma UCL	28.6		

Potential UCL to Use		
	Use 95% Student's-t UCL	25.56
	or 95% Modified-t UCL	25.81

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	0.855	Maximum of Log Data	-0.157
Mean	0.259	Mean of log Data	-1.575
Median	0.2	SD of log Data	0.642
SD	0.233		
Coefficient of Variation	0.898		
Skewness	2.561		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.814
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.404	95% H-UCL	0.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.484
95% Adjusted-CLT UCL (Chen-1995)	0.458	97.5% Chebyshev (MVUE) UCL	0.586
95% Modified-t UCL (Johnson-1978)	0.415	99% Chebyshev (MVUE) UCL	0.786

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.656	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.157		
MLE of Mean	0.259		
MLE of Standard Deviation	0.201		
nu star	29.8		
Approximate Chi Square Value (.05)	18.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.387
Adjusted Chi Square Value	16.47	95% Jackknife UCL	0.404
		95% Standard Bootstrap UCL	0.376
Anderson-Darling Test Statistic	0.899	95% Bootstrap-t UCL	0.632
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	0.862
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	0.399
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	0.472
Data follow Appr. Gamma Distribution at 5% Significan		95% Chebyshev(Mean, Sd) UCL	0.597
		97.5% Chebyshev(Mean, Sd) UCL	0.744
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.031
95% Approximate Gamma UCL	0.421		
95% Adjusted Gamma UCL	0.469		

Potential UCL to Use		Use 95% Approximate Gamma UCL	0.421

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	9	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0875	Minimum of Log Data	-2.436
Maximum	0.39	Maximum of Log Data	-0.942
Mean	0.226	Mean of log Data	-1.581
Median	0.226	SD of log Data	0.494
SD	0.0957		
Coefficient of Variation	0.422		
Skewness	0.128		

Warning: There are only 9 Values in this data
Note: It should be noted that even though bootstrap methods may be performed on this data set,
the resulting calculations may not be reliable enough to draw conclusions

The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.829	Shapiro Wilk Critical Value	0.829
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.286	95% H-UCL	0.343
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.396
95% Adjusted-CLT UCL (Chen-1995)	0.28	97.5% Chebyshev (MVUE) UCL	0.468
95% Modified-t UCL (Johnson-1978)	0.286	99% Chebyshev (MVUE) UCL	0.61

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.649	Data appear Normal at 5% Significance Level	
Theta Star	0.0621		
MLE of Mean	0.226		
MLE of Standard Deviation	0.119		
nu star	65.69		
Approximate Chi Square Value (.05)	48.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0231	95% CLT UCL	0.279
Adjusted Chi Square Value	44.87	95% Jackknife UCL	0.286
		95% Standard Bootstrap UCL	0.276
Anderson-Darling Test Statistic	0.805	95% Bootstrap-t UCL	0.29
Anderson-Darling 5% Critical Value	0.723	95% Hall's Bootstrap UCL	0.308
Kolmogorov-Smirnov Test Statistic	0.335	95% Percentile Bootstrap UCL	0.278
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL	0.274
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.365
		97.5% Chebyshev(Mean, Sd) UCL	0.426
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.544
95% Approximate Gamma UCL	0.31		
95% Adjusted Gamma UCL	0.332		

Potential UCL to Use		Use 95% Student's-t UCL	0.286

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	099-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	8590	Minimum of Log Data	9.058
Maximum	15000	Maximum of Log Data	9.616
Mean	10931	Mean of log Data	9.289
Median	10931	SD of log Data	0.144
SD	1628		
Coefficient of Variation	0.149		
Skewness	0.942		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11645	95% H-UCL	11679
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12650
95% Adjusted-CLT UCL (Chen-1995)	11703	97.5% Chebyshev (MVUE) UCL	13395
95% Modified-t UCL (Johnson-1978)	11661	99% Chebyshev (MVUE) UCL	14857

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	41.16	Data do not follow a Discernable Distribution (0.05)	
Theta Star	265.6		
MLE of Mean	10931		
MLE of Standard Deviation	1704		
nu star	1317		
Approximate Chi Square Value (.05)	1234	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	11601
Adjusted Chi Square Value	1225	95% Jackknife UCL	11645
		95% Standard Bootstrap UCL	11591
Anderson-Darling Test Statistic	1.178	95% Bootstrap-t UCL	11850
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	12235
Kolmogorov-Smirnov Test Statistic	0.294	95% Percentile Bootstrap UCL	11585
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	11734
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12706
		97.5% Chebyshev(Mean, Sd) UCL	13474
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14982
95% Approximate Gamma UCL	11669		
95% Adjusted Gamma UCL	11757		

Potential UCL to Use		
	Use 95% Student's-t UCL	11645
	or 95% Modified-t UCL	11661

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	6.51	Minimum of Log Data	1.873
Maximum	12.4	Maximum of Log Data	2.518
Mean	9.183	Mean of log Data	2.201
Median	8.61	SD of log Data	0.185
SD	1.72E+00		
Coefficient of Variation	0.187		
Skewness	0.479		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.935	95% H-UCL	10.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.04
95% Adjusted-CLT UCL (Chen-1995)	9.943	97.5% Chebyshev (MVUE) UCL	11.85
95% Modified-t UCL (Johnson-1978)	9.943	99% Chebyshev (MVUE) UCL	13.43

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.44	Data appear Normal at 5% Significance Level	
Theta Star	0.361		
MLE of Mean	9.183		
MLE of Standard Deviation	1.821		
nu star	814		
Approximate Chi Square Value (.05)	748.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	9.888
Adjusted Chi Square Value	741.6	95% Jackknife UCL	9.935
		95% Standard Bootstrap UCL	9.875
Anderson-Darling Test Statistic	0.417	95% Bootstrap-t UCL	10.11
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	9.953
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	9.883
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	9.893
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.05
		97.5% Chebyshev(Mean, Sd) UCL	11.86
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.45
95% Approximate Gamma UCL	9.983		
95% Adjusted Gamma UCL	10.08		

Potential UCL to Use		Use 95% Student's-t UCL	9.935

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	76.7	Minimum of Log Data	4.34
Maximum	192	Maximum of Log Data	5.257
Mean	123.5	Mean of log Data	4.794
Median	123.5	SD of log Data	0.218
SD	26.18		
Coefficient of Variation	0.212		
Skewness	0.548		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.818	Shapiro Wilk Test Statistic	0.814
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	134.9	95% H-UCL	137
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	153.1
95% Adjusted-CLT UCL (Chen-1995)	135.2	97.5% Chebyshev (MVUE) UCL	165.9
95% Modified-t UCL (Johnson-1978)	135.1	99% Chebyshev (MVUE) UCL	191

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.97	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.507		
MLE of Mean	123.5		
MLE of Standard Deviation	28.34		
nu star	607.1		
Approximate Chi Square Value (.05)	550.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	134.2
Adjusted Chi Square Value	544.8	95% Jackknife UCL	134.9
		95% Standard Bootstrap UCL	133.7
Anderson-Darling Test Statistic	1.563	95% Bootstrap-t UCL	135.9
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	139.9
Kolmogorov-Smirnov Test Statistic	0.34	95% Percentile Bootstrap UCL	134.5
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	134.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	152
		97.5% Chebyshev(Mean, Sd) UCL	164.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	188.6
95% Approximate Gamma UCL	136		
95% Adjusted Gamma UCL	137.6		

Potential UCL to Use		
	Use 95% Student's-t UCL	134.9
	or 95% Modified-t UCL	135.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.486	Minimum of Log Data	-0.722
Maximum	1	Maximum of Log Data	0
Mean	0.668	Mean of log Data	-0.418
Median	0.668	SD of log Data	0.174
SD	0.123		
Coefficient of Variation	0.185		
Skewness	1.326		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.783	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.722	95% H-UCL	0.724
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.795
95% Adjusted-CLT UCL (Chen-1995)	0.73	97.5% Chebyshev (MVUE) UCL	0.85
95% Modified-t UCL (Johnson-1978)	0.724	99% Chebyshev (MVUE) UCL	0.958

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	27.84	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.024		
MLE of Mean	0.668		
MLE of Standard Deviation	0.127		
nu star	890.9		
Approximate Chi Square Value (.05)	822.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.719
Adjusted Chi Square Value	815.2	95% Jackknife UCL	0.722
		95% Standard Bootstrap UCL	0.717
Anderson-Darling Test Statistic	1.581	95% Bootstrap-t UCL	0.744
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	1.062
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	0.718
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.726
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.802
		97.5% Chebyshev(Mean, Sd) UCL	0.861
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.975
95% Approximate Gamma UCL	0.723		
95% Adjusted Gamma UCL	0.73		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.722
	or 95% Modified-t UCL	0.724

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	14.5	Minimum of Log Data	2.674
Maximum	116.8	Maximum of Log Data	4.76
Mean	52.22	Mean of log Data	3.879
Median	51.98	SD of log Data	0.424
SD	21.21		
Coefficient of Variation	0.406		
Skewness	1.671		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Test Statistic	0.851
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	61.52	95% H-UCL	65.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.47
95% Adjusted-CLT UCL (Chen-1995)	63.31	97.5% Chebyshev (MVUE) UCL	88.23
95% Modified-t UCL (Johnson-1978)	61.89	99% Chebyshev (MVUE) UCL	109.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.474	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	9.539		
MLE of Mean	52.22		
MLE of Standard Deviation	22.32		
nu star	175.2		
Approximate Chi Square Value (.05)	145.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	60.95
Adjusted Chi Square Value	142.5	95% Jackknife UCL	61.52
		95% Standard Bootstrap UCL	60.51
Anderson-Darling Test Statistic	0.877	95% Bootstrap-t UCL	64.43
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	113.7
Kolmogorov-Smirnov Test Statistic	0.19	95% Percentile Bootstrap UCL	60.97
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	62.42
Data follow Appr. Gamma Distribution at 5% Significance		95% Chebyshev(Mean, Sd) UCL	75.34
		97.5% Chebyshev(Mean, Sd) UCL	85.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105
95% Approximate Gamma UCL	62.85		
95% Adjusted Gamma UCL	64.2		

Potential UCL to Use	Use 95% Approximate Gamma UCL	62.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	-0.00983	Log Statistics Not Avaliable
Maximum	0.0212	
Mean	0.00569	
Median	0.00569	
SD	0.00567	
Coefficient of Variation	9.97E-01	
Skewness	5.32E-16	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.511	Not Available
Shapiro Wilk Critical Value	0.887	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.00817	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.00817	95% Adjusted-CLT UCL (Chen 1995)	0.00801
		95% Modified-t UCL (Johnson-1978)	0.00817

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0119	95% CLT UCL		0.00801
		95% Jackknife UCL		0.00817
		95% Standard Bootstrap UCL	N/A	
		95% Bootstrap-t UCL	N/A	
		95% Hall's Bootstrap UCL	N/A	
		95% Percentile Bootstrap UCL	N/A	
		95% BCA Bootstrap UCL	N/A	
		95% Chebyshev(Mean, Sd) UCL		0.0119
		97.5% Chebyshev(Mean, Sd) UCL		0.0145
		99% Chebyshev(Mean, Sd) UCL		0.0198

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	381.6	Minimum of Log Data	5.944
Maximum	1230	Maximum of Log Data	7.115
Mean	541.8	Mean of log Data	6.254
Median	516.2	SD of log Data	0.271
SD	196.6		
Coefficient of Variation	0.363		
Skewness	3.15		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.782
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	628	95% H-UCL	613.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	698.7
95% Adjusted-CLT UCL (Chen-1995)	664	97.5% Chebyshev (MVUE) UCL	768.3
95% Modified-t UCL (Johnson-1978)	634.4	99% Chebyshev (MVUE) UCL	904.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.99	Data do not follow a Discernable Distribution (0.05)	
Theta Star	54.24		
MLE of Mean	541.8		
MLE of Standard Deviation	171.4		
nu star	319.7		
Approximate Chi Square Value (.05)	279.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	622.7
Adjusted Chi Square Value	275	95% Jackknife UCL	628
		95% Standard Bootstrap UCL	619.2
Anderson-Darling Test Statistic	1.353	95% Bootstrap-t UCL	731.7
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	963.8
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	632.1
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	673.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	756.1
		97.5% Chebyshev(Mean, Sd) UCL	848.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1031
95% Approximate Gamma UCL	620.2		
95% Adjusted Gamma UCL	629.9		
Potential UCL to Use		Use 95% Student's-t UCL	628
		or 95% Modified-t UCL	634.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	0.0135	Minimum of Log Data	-4.305
Maximum	10	Maximum of Log Data	2.303
Mean	5.812	Mean of log Data	0.263
Median	8.375	SD of log Data	2.654
SD	4.735		
Coefficient of Variation	0.815		
Skewness	-0.407		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.712	Shapiro Wilk Test Statistic	0.72
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.887	95% H-UCL	2247
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	95.86
95% Adjusted-CLT UCL (Chen-1995)	7.63	97.5% Chebyshev (MVUE) UCL	127.6
95% Modified-t UCL (Johnson-1978)	7.867	99% Chebyshev (MVUE) UCL	190

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.394	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.74		
MLE of Mean	5.812		
MLE of Standard Deviation	9.257		
nu star	12.61		
Approximate Chi Square Value (.05)	5.634	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	7.759
Adjusted Chi Square Value	5.111	95% Jackknife UCL	7.887
		95% Standard Bootstrap UCL	7.727
Anderson-Darling Test Statistic	2.373	95% Bootstrap-t UCL	7.736
Anderson-Darling 5% Critical Value	0.81	95% Hall's Bootstrap UCL	7.475
Kolmogorov-Smirnov Test Statistic	0.319	95% Percentile Bootstrap UCL	7.638
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	7.549
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.97
		97.5% Chebyshev(Mean, Sd) UCL	13.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.59
95% Approximate Gamma UCL	13.01		
95% Adjusted Gamma UCL	14.34		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.59
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	10.2	Minimum of Log Data	2.322
Maximum	90.47	Maximum of Log Data	4.505
Mean	56.37	Mean of log Data	3.843
Median	65	SD of log Data	0.74
SD	26.43		
Coefficient of Variation	0.469		
Skewness	-0.888		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk Test Statistic	0.728
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.95	95% H-UCL	95.86
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	111.7
95% Adjusted-CLT UCL (Chen-1995)	65.67	97.5% Chebyshev (MVUE) UCL	134
95% Modified-t UCL (Johnson-1978)	67.71	99% Chebyshev (MVUE) UCL	177.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.321	Data do not follow a Discernable Distribution (0.05)	
Theta Star	24.29		
MLE of Mean	56.37		
MLE of Standard Deviation	37		
nu star	74.26		
Approximate Chi Square Value (.05)	55.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	67.24
Adjusted Chi Square Value	53.57	95% Jackknife UCL	67.95
		95% Standard Bootstrap UCL	66.96
Anderson-Darling Test Statistic	1.922	95% Bootstrap-t UCL	67.2
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	65.58
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	66.51
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	65.86
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.17
		97.5% Chebyshev(Mean, Sd) UCL	97.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	122.1
95% Approximate Gamma UCL	75.54		
95% Adjusted Gamma UCL	78.15		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	85.17

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	10.3	Maximum of Log Data	2.332
Mean	6.951	Mean of log Data	0.859
Median	10	SD of log Data	2.414
SD	4.42		
Coefficient of Variation	0.636		
Skewness	-0.932		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.678	Shapiro Wilk Test Statistic	0.614
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.888	95% H-UCL	1157
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	105.3
95% Adjusted-CLT UCL (Chen-1995)	8.494	97.5% Chebyshev (MVUE) UCL	139.6
95% Modified-t UCL (Johnson-1978)	8.845	99% Chebyshev (MVUE) UCL	206.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.509	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.65		
MLE of Mean	6.951		
MLE of Standard Deviation	9.74		
nu star	16.3		
Approximate Chi Square Value (.05)	8.172	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	8.768
Adjusted Chi Square Value	7.524	95% Jackknife UCL	8.888
		95% Standard Bootstrap UCL	8.72
Anderson-Darling Test Statistic	3.214	95% Bootstrap-t UCL	8.609
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	8.477
Kolmogorov-Smirnov Test Statistic	0.386	95% Percentile Bootstrap UCL	8.685
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	8.571
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.77
		97.5% Chebyshev(Mean, Sd) UCL	13.85
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.94
95% Approximate Gamma UCL	13.86		
95% Adjusted Gamma UCL	15.06		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.94
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.97	Minimum of Log Data	-0.0305
Maximum	20	Maximum of Log Data	2.996
Mean	11.67	Mean of log Data	2.119
Median	10.16	SD of log Data	0.995
SD	7.623		
Coefficient of Variation	0.653		
Skewness	-0.0514		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.843
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.01	95% H-UCL	27.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.65
95% Adjusted-CLT UCL (Chen-1995)	14.78	97.5% Chebyshev (MVUE) UCL	35.39
95% Modified-t UCL (Johnson-1978)	15.01	99% Chebyshev (MVUE) UCL	48.63

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.363	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	8.565		
MLE of Mean	11.67		
MLE of Standard Deviation	9.998		
nu star	43.6		
Approximate Chi Square Value (.05)	29.46	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	14.8
Adjusted Chi Square Value	28.14	95% Jackknife UCL	15.01
		95% Standard Bootstrap UCL	14.71
Anderson-Darling Test Statistic	0.849	95% Bootstrap-t UCL	14.92
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	14.67
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	14.75
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	14.74
Data follow Appr. Gamma Distribution at 5% Significance		95% Chebyshev(Mean, Sd) UCL	19.98
		97.5% Chebyshev(Mean, Sd) UCL	23.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.63
95% Approximate Gamma UCL	17.27		
95% Adjusted Gamma UCL	18.08		

Potential UCL to Use		Use 95% Approximate Gamma UCL	17.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.455	Minimum of Log Data	-0.787
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.878	Mean of log Data	-0.147
Median	0.878	SD of log Data	0.197
SD	0.154		
Coefficient of Variation	0.176		
Skewness	2.02E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.511	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.945	95% H-UCL	0.964
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.069
95% Adjusted-CLT UCL (Chen-1995)	0.941	97.5% Chebyshev (MVUE) UCL	1.151
95% Modified-t UCL (Johnson-1978)	0.945	99% Chebyshev (MVUE) UCL	1.312

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	24.82	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0354			
MLE of Mean	0.878			
MLE of Standard Deviation	0.176			
nu star	794.3			
Approximate Chi Square Value (.05)	729.9	Nonparametric Statistics		
Adjusted Level of Significance	0.0335	95% CLT UCL		0.941
Adjusted Chi Square Value	722.9	95% Jackknife UCL		0.945
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.212	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		1.046
		97.5% Chebyshev(Mean, Sd) UCL		1.118
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		1.261
95% Approximate Gamma UCL	0.955			
95% Adjusted Gamma UCL	0.964			

Potential UCL to Use		
	Use 95% Student's-t UCL	0.945
	or 95% Modified-t UCL	0.945

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	099-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	11	Minimum of Log Data	2.398
Maximum	85	Maximum of Log Data	4.443
Mean	56.34	Mean of log Data	3.895
Median	55.72	SD of log Data	0.6
SD	25.8		
Coefficient of Variation	0.458		
Skewness	-0.159		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.828
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.65	95% H-UCL	82.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.75
95% Adjusted-CLT UCL (Chen-1995)	66.68	97.5% Chebyshev (MVUE) UCL	114.9
95% Modified-t UCL (Johnson-1978)	67.61	99% Chebyshev (MVUE) UCL	148.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.143	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.93		
MLE of Mean	56.34		
MLE of Standard Deviation	31.78		
nu star	100.6		
Approximate Chi Square Value (.05)	78.44	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	66.95
Adjusted Chi Square Value	76.21	95% Jackknife UCL	67.65
		95% Standard Bootstrap UCL	66.72
Anderson-Darling Test Statistic	0.897	95% Bootstrap-t UCL	67.44
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	66.58
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	66.81
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	66.17
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	84.46
		97.5% Chebyshev(Mean, Sd) UCL	96.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	120.5
95% Approximate Gamma UCL	72.24		
95% Adjusted Gamma UCL	74.35		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	84.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	-0.0098	Log Statistics Not Avaliable
Maximum	0.0212	
Mean	0.00569	
Median	0.00569	
SD	0.00567	
Coefficient of Variation	0.997	
Skewness	5.32E-16	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.511	Not Available
Shapiro Wilk Critical Value	0.887	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.00817	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.00817	95% Adjusted-CLT UCL (Chen 1995)	0.00801
		95% Modified-t UCL (Johnson-1978)	0.00817

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0119	95% CLT UCL		0.00801
		95% Jackknife UCL		0.00817
		95% Standard Bootstrap UCL	N/A	
		95% Bootstrap-t UCL	N/A	
		95% Hall's Bootstrap UCL	N/A	
		95% Percentile Bootstrap UCL	N/A	
		95% BCA Bootstrap UCL	N/A	
		95% Chebyshev(Mean, Sd) UCL		0.0119
		97.5% Chebyshev(Mean, Sd) UCL		0.0145
		99% Chebyshev(Mean, Sd) UCL		0.0198

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.089	Minimum of Log Data	-2.419
Maximum	10	Maximum of Log Data	2.303
Mean	8.551	Mean of log Data	1.693
Median	10	SD of log Data	1.597
SD	3.339		
Coefficient of Variation	0.39		
Skewness	-2.409		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.483	Shapiro Wilk Test Statistic	0.419
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.01	95% H-UCL	90.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	50.46
95% Adjusted-CLT UCL (Chen-1995)	9.387	97.5% Chebyshev (MVUE) UCL	65.06
95% Modified-t UCL (Johnson-1978)	9.93	99% Chebyshev (MVUE) UCL	93.75

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.051	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.133		
MLE of Mean	8.551		
MLE of Standard Deviation	8.339		
nu star	33.65		
Approximate Chi Square Value (.05)	21.38	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	9.924
Adjusted Chi Square Value	20.27	95% Jackknife UCL	10.01
		95% Standard Bootstrap UCL	9.886
Anderson-Darling Test Statistic	4.875	95% Bootstrap-t UCL	9.71
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	9.441
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	9.789
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	9.608
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.19
		97.5% Chebyshev(Mean, Sd) UCL	13.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.86
95% Approximate Gamma UCL	13.46		
95% Adjusted Gamma UCL	14.19		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	16.86
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	5.53	Minimum of Log Data	1.71
Maximum	70.21	Maximum of Log Data	4.251
Mean	56.97	Mean of log Data	3.867
Median	65	SD of log Data	0.805
SD	20.08		
Coefficient of Variation	0.353		
Skewness	-2.394		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.508	Shapiro Wilk Test Statistic	0.448
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.77	95% H-UCL	109.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	125
95% Adjusted-CLT UCL (Chen-1995)	62.01	97.5% Chebyshev (MVUE) UCL	151.3
95% Modified-t UCL (Johnson-1978)	65.27	99% Chebyshev (MVUE) UCL	202.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.489	Data do not follow a Discernable Distribution (0.05)	
Theta Star	22.89		
MLE of Mean	56.97		
MLE of Standard Deviation	36.11		
nu star	79.64		
Approximate Chi Square Value (.05)	60.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	65.22
Adjusted Chi Square Value	58.15	95% Jackknife UCL	65.77
		95% Standard Bootstrap UCL	64.94
Anderson-Darling Test Statistic	4.382	95% Bootstrap-t UCL	63.52
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	62.66
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	64.47
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	62.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.85
		97.5% Chebyshev(Mean, Sd) UCL	88.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.9
95% Approximate Gamma UCL	75.51		
95% Adjusted Gamma UCL	78.02		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	78.85
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	2.42	Minimum of Log Data	0.884
Maximum	10.3	Maximum of Log Data	2.332
Mean	9.48	Mean of log Data	2.209
Median	10	SD of log Data	0.354
SD	1.893		
Coefficient of Variation	0.2		
Skewness	-3.926		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.342	Shapiro Wilk Test Statistic	0.31
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.31	95% H-UCL	11.55
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.44
95% Adjusted-CLT UCL (Chen-1995)	9.762	97.5% Chebyshev (MVUE) UCL	15.08
95% Modified-t UCL (Johnson-1978)	10.23	99% Chebyshev (MVUE) UCL	18.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.92		
MLE of Mean	9.48		
MLE of Standard Deviation	2.953		
nu star	329.8		
Approximate Chi Square Value (.05)	288.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.26
Adjusted Chi Square Value	284.3	95% Jackknife UCL	10.31
		95% Standard Bootstrap UCL	10.22
Anderson-Darling Test Statistic	5.083	95% Bootstrap-t UCL	10.06
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	9.956
Kolmogorov-Smirnov Test Statistic	0.475	95% Percentile Bootstrap UCL	10.01
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	9.959
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.54
		97.5% Chebyshev(Mean, Sd) UCL	12.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.19
95% Approximate Gamma UCL	10.83		
95% Adjusted Gamma UCL	11		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.31
	or 95% Modified-t UCL	10.23

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.455	Minimum of Log Data	-0.787
Maximum	1.3	Maximum of Log Data	0.262
Mean	0.878	Mean of log Data	-0.147
Median	0.878	SD of log Data	0.197
SD	0.154		
Coefficient of Variation	0.176		
Skewness	2.02E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.511	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.945	95% H-UCL	0.964
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.069
95% Adjusted-CLT UCL (Chen-1995)	0.941	97.5% Chebyshev (MVUE) UCL	1.151
95% Modified-t UCL (Johnson-1978)	0.945	99% Chebyshev (MVUE) UCL	1.312

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	24.82	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0354			
MLE of Mean	0.878			
MLE of Standard Deviation	0.176			
nu star	794.3			
Approximate Chi Square Value (.05)	729.9	Nonparametric Statistics		
Adjusted Level of Significance	0.0335	95% CLT UCL		0.941
Adjusted Chi Square Value	722.9	95% Jackknife UCL		0.945
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.212	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		1.046
		97.5% Chebyshev(Mean, Sd) UCL		1.118
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		1.261
95% Approximate Gamma UCL	0.955			
95% Adjusted Gamma UCL	0.964			

Potential UCL to Use		
	Use 95% Student's-t UCL	0.945
	or 95% Modified-t UCL	0.945

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.44	Minimum of Log Data	-0.821
Maximum	1.5	Maximum of Log Data	0.405
Mean	0.783	Mean of log Data	-0.272
Median	0.783	SD of log Data	0.233
SD	0.201		
Coefficient of Variation	0.256		
Skewness	2.335		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.609
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.862	95% H-UCL	0.864
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.965
95% Adjusted-CLT UCL (Chen-1995)	0.885	97.5% Chebyshev (MVUE) UCL	1.044
95% Modified-t UCL (Johnson-1978)	0.866	99% Chebyshev (MVUE) UCL	1.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	16.03	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0488		
MLE of Mean	0.783		
MLE of Standard Deviation	0.195		
nu star	609.2		
Approximate Chi Square Value (.05)	552.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.858
Adjusted Chi Square Value	548.3	95% Jackknife UCL	0.862
		95% Standard Bootstrap UCL	0.856
Anderson-Darling Test Statistic	3.914	95% Bootstrap-t UCL	0.89
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1.264
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	0.861
Kolmogorov-Smirnov 5% Critical Value	0.198	95% BCA Bootstrap UCL	0.887
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.983
		97.5% Chebyshev(Mean, Sd) UCL	1.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.24
95% Approximate Gamma UCL	0.862		
95% Adjusted Gamma UCL	0.869		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.862
	or 95% Modified-t UCL	0.866

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	19	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	5.65	Minimum of Log Data	1.732
Maximum	14.4	Maximum of Log Data	2.667
Mean	9.216	Mean of log Data	2.186
Median	8.9	SD of log Data	0.277
SD	2.44		
Coefficient of Variation	0.265		
Skewness	0.113		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.902
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.19	95% H-UCL	10.42
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.81
95% Adjusted-CLT UCL (Chen-1995)	10.15	97.5% Chebyshev (MVUE) UCL	12.92
95% Modified-t UCL (Johnson-1978)	10.19	99% Chebyshev (MVUE) UCL	15.12
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.19	Data appear Normal at 5% Significance Level	
Theta Star	0.756		
MLE of Mean	9.216		
MLE of Standard Deviation	2.64		
nu star	463.2		
Approximate Chi Square Value (.05)	414.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	10.14
Adjusted Chi Square Value	410.2	95% Jackknife UCL	10.19
		95% Standard Bootstrap UCL	10.09
Anderson-Darling Test Statistic	0.86	95% Bootstrap-t UCL	10.16
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	10.14
Kolmogorov-Smirnov Test Statistic	0.256	95% Percentile Bootstrap UCL	10.07
Kolmogorov-Smirnov 5% Critical Value	0.198	95% BCA Bootstrap UCL	10.17
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.66
		97.5% Chebyshev(Mean, Sd) UCL	12.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.79
95% Approximate Gamma UCL	10.3		
95% Adjusted Gamma UCL	10.41		
Potential UCL to Use		Use 95% Student's-t UCL	10.19

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.49	Minimum of Log Data	-0.713
Maximum	0.69	Maximum of Log Data	-0.371
Mean	0.58	Mean of log Data	-0.547
Median	0.58	SD of log Data	0.0708
SD	0.041		
Coefficient of Variation	0.0706		
Skewness	0.276		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.662	Shapiro Wilk Test Statistic	0.662
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.596	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.621
95% Adjusted-CLT UCL (Chen-1995)	0.596	97.5% Chebyshev (MVUE) UCL	0.639
95% Modified-t UCL (Johnson-1978)	0.596	99% Chebyshev (MVUE) UCL	0.674

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	178.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00325		
MLE of Mean	0.58		
MLE of Standard Deviation	0.0434		
nu star	6771		
Approximate Chi Square Value (.05)	6581	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.595
Adjusted Chi Square Value	6565	95% Jackknife UCL	0.596
		95% Standard Bootstrap UCL	0.595
Anderson-Darling Test Statistic	3.577	95% Bootstrap-t UCL	0.597
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.602
Kolmogorov-Smirnov Test Statistic	0.404	95% Percentile Bootstrap UCL	0.596
Kolmogorov-Smirnov 5% Critical Value	0.198	95% BCA Bootstrap UCL	0.595
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.621
		97.5% Chebyshev(Mean, Sd) UCL	0.639
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.673
95% Approximate Gamma UCL	0.597		
95% Adjusted Gamma UCL	0.598		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.596
	or 95% Modified-t UCL	0.596

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	19	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	15.2	Minimum of Log Data	2.721
Maximum	85	Maximum of Log Data	4.443
Mean	52.34	Mean of log Data	3.807
Median	38.71	SD of log Data	0.594
SD	27.2		
Coefficient of Variation	0.52		
Skewness	0.218		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.819	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.16	95% H-UCL	72.04
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.16
95% Adjusted-CLT UCL (Chen-1995)	62.93	97.5% Chebyshev (MVUE) UCL	100.5
95% Modified-t UCL (Johnson-1978)	63.21	99% Chebyshev (MVUE) UCL	128.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.958	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.69		
MLE of Mean	52.34		
MLE of Standard Deviation	30.43		
nu star	112.4		
Approximate Chi Square Value (.05)	88.93	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	62.6
Adjusted Chi Square Value	87.1	95% Jackknife UCL	63.16
		95% Standard Bootstrap UCL	62.42
Anderson-Darling Test Statistic	1.105	95% Bootstrap-t UCL	63.05
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	62.46
Kolmogorov-Smirnov Test Statistic	0.244	95% Percentile Bootstrap UCL	62.62
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	63.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.54
		97.5% Chebyshev(Mean, Sd) UCL	91.31
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	114.4
95% Approximate Gamma UCL	66.15		
95% Adjusted Gamma UCL	67.54		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	79.54

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	19	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	134.4	Minimum of Log Data	4.901
Maximum	1030	Maximum of Log Data	6.937
Mean	458	Mean of log Data	5.969
Median	373	SD of log Data	0.576
SD	271.8		
Coefficient of Variation	0.593		
Skewness	1.03		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.968
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	566.2	95% H-UCL	612.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	732.7
95% Adjusted-CLT UCL (Chen-1995)	576.4	97.5% Chebyshev (MVUE) UCL	851.9
95% Modified-t UCL (Johnson-1978)	568.6	99% Chebyshev (MVUE) UCL	1086

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.837	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	161.5		
MLE of Mean	458		
MLE of Standard Deviation	272		
nu star	107.8		
Approximate Chi Square Value (.05)	84.83	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	560.6
Adjusted Chi Square Value	83.05	95% Jackknife UCL	566.2
		95% Standard Bootstrap UCL	558.2
Anderson-Darling Test Statistic	0.403	95% Bootstrap-t UCL	600.3
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	572.9
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	562
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	572.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	729.9
		97.5% Chebyshev(Mean, Sd) UCL	847.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1079
95% Approximate Gamma UCL	582		
95% Adjusted Gamma UCL	594.5		

Potential UCL to Use		Use 95% Approximate Gamma UCL	582

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.01	Minimum of Log Data	-4.605
Maximum	10	Maximum of Log Data	2.303
Mean	7.731	Mean of log Data	1.067
Median	10	SD of log Data	2.443
SD	4.145		
Coefficient of Variation	0.536		
Skewness	-1.441		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.559	Shapiro Wilk Test Statistic	0.553
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.381	95% H-UCL	1050
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	143.3
95% Adjusted-CLT UCL (Chen-1995)	8.96	97.5% Chebyshev (MVUE) UCL	189.7
95% Modified-t UCL (Johnson-1978)	9.328	99% Chebyshev (MVUE) UCL	280.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.564	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.72		
MLE of Mean	7.731		
MLE of Standard Deviation	10.3		
nu star	21.42		
Approximate Chi Square Value (.05)	11.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	9.296
Adjusted Chi Square Value	11.29	95% Jackknife UCL	9.381
		95% Standard Bootstrap UCL	9.254
Anderson-Darling Test Statistic	4.909	95% Bootstrap-t UCL	9.073
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	8.941
Kolmogorov-Smirnov Test Statistic	0.473	95% Percentile Bootstrap UCL	9.301
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	8.95
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.88
		97.5% Chebyshev(Mean, Sd) UCL	13.67
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.19
95% Approximate Gamma UCL	13.91		
95% Adjusted Gamma UCL	14.67		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.19
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	7.3	Minimum of Log Data	1.988
Maximum	65	Maximum of Log Data	4.174
Mean	52.42	Mean of log Data	3.72
Median	65	SD of log Data	0.882
SD	23.71		
Coefficient of Variation	0.452		
Skewness	-1.526		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.543	Shapiro Wilk Test Statistic	0.53
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	61.85	95% H-UCL	101.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.6
95% Adjusted-CLT UCL (Chen-1995)	59.33	97.5% Chebyshev (MVUE) UCL	141.3
95% Modified-t UCL (Johnson-1978)	61.53	99% Chebyshev (MVUE) UCL	190

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.924	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.24		
MLE of Mean	52.42		
MLE of Standard Deviation	37.79		
nu star	73.13		
Approximate Chi Square Value (.05)	54.44	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	61.37
Adjusted Chi Square Value	53.03	95% Jackknife UCL	61.85
		95% Standard Bootstrap UCL	61.01
Anderson-Darling Test Statistic	4.694	95% Bootstrap-t UCL	60.16
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	59.52
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	61.07
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	58.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.13
		97.5% Chebyshev(Mean, Sd) UCL	86.39
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.5
95% Approximate Gamma UCL	70.42		
95% Adjusted Gamma UCL	72.29		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	76.13
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	10.93	Maximum of Log Data	2.392
Mean	8.474	Mean of log Data	1.37
Median	10	SD of log Data	2.228
SD	3.764		
Coefficient of Variation	0.444		
Skewness	-2.026		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.477	Shapiro Wilk Test Statistic	0.459
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.971	95% H-UCL	543.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	123.4
95% Adjusted-CLT UCL (Chen-1995)	9.465	97.5% Chebyshev (MVUE) UCL	162.5
95% Modified-t UCL (Johnson-1978)	9.904	99% Chebyshev (MVUE) UCL	239.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.689	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.29		
MLE of Mean	8.474		
MLE of Standard Deviation	10.21		
nu star	26.19		
Approximate Chi Square Value (.05)	15.53	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	9.894
Adjusted Chi Square Value	14.81	95% Jackknife UCL	9.971
		95% Standard Bootstrap UCL	9.877
Anderson-Darling Test Statistic	5.971	95% Bootstrap-t UCL	9.708
Anderson-Darling 5% Critical Value	0.778	95% Hall's Bootstrap UCL	9.562
Kolmogorov-Smirnov Test Statistic	0.543	95% Percentile Bootstrap UCL	9.621
Kolmogorov-Smirnov 5% Critical Value	0.206	95% BCA Bootstrap UCL	9.525
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.24
		97.5% Chebyshev(Mean, Sd) UCL	13.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.06
95% Approximate Gamma UCL	14.29		
95% Adjusted Gamma UCL	14.98		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.06

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.25	Minimum of Log Data	-1.386
Maximum	0.64	Maximum of Log Data	-0.446
Mean	0.353	Mean of log Data	-1.061
Median	0.353	SD of log Data	0.19
SD	0.0783		
Coefficient of Variation	0.222		
Skewness	2.733		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.527	Shapiro Wilk Test Statistic	0.605
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.384	95% H-UCL	0.381
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.419
95% Adjusted-CLT UCL (Chen-1995)	0.394	97.5% Chebyshev (MVUE) UCL	0.448
95% Modified-t UCL (Johnson-1978)	0.386	99% Chebyshev (MVUE) UCL	0.506

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	22.65	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0156		
MLE of Mean	0.353		
MLE of Standard Deviation	0.0741		
nu star	860.8		
Approximate Chi Square Value (.05)	793.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.382
Adjusted Chi Square Value	788.1	95% Jackknife UCL	0.384
		95% Standard Bootstrap UCL	0.382
Anderson-Darling Test Statistic	3.74	95% Bootstrap-t UCL	0.398
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.526
Kolmogorov-Smirnov Test Statistic	0.422	95% Percentile Bootstrap UCL	0.382
Kolmogorov-Smirnov 5% Critical Value	0.198	95% BCA Bootstrap UCL	0.393
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.431
		97.5% Chebyshev(Mean, Sd) UCL	0.465
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.531
95% Approximate Gamma UCL	0.382		
95% Adjusted Gamma UCL	0.385		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.384
	or 95% Modified-t UCL	0.386

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	19	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	29.3	Minimum of Log Data	3.378
Maximum	46.5	Maximum of Log Data	3.839
Mean	36.23	Mean of log Data	3.587
Median	36.23	SD of log Data	0.0816
SD	3.059		
Coefficient of Variation	0.0844		
Skewness	1.512		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.554	Shapiro Wilk Test Statistic	0.575
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	37.44	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.18
95% Adjusted-CLT UCL (Chen-1995)	37.64	97.5% Chebyshev (MVUE) UCL	40.46
95% Modified-t UCL (Johnson-1978)	37.48	99% Chebyshev (MVUE) UCL	42.97
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	131.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.276		
MLE of Mean	36.23		
MLE of Standard Deviation	3.162		
nu star	4988		
Approximate Chi Square Value (.05)	4825	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	37.38
Adjusted Chi Square Value	4811	95% Jackknife UCL	37.44
		95% Standard Bootstrap UCL	37.34
Anderson-Darling Test Statistic	4.191	95% Bootstrap-t UCL	37.61
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	40.56
Kolmogorov-Smirnov Test Statistic	0.405	95% Percentile Bootstrap UCL	37.48
Kolmogorov-Smirnov 5% Critical Value	0.198	95% BCA Bootstrap UCL	37.65
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.28
		97.5% Chebyshev(Mean, Sd) UCL	40.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.21
95% Approximate Gamma UCL	37.45		
95% Adjusted Gamma UCL	37.56		
Potential UCL to Use		Use 95% Student's-t UCL	37.44
		or 95% Modified-t UCL	37.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-02.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Antimony

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.4	Minimum of Log Data	-0.916
Maximum	0.97	Maximum of Log Data	-0.0305
Mean	0.593	Mean of log Data	-0.543
Median	0.593	SD of log Data	0.21
SD	0.133		
Coefficient of Variation	0.224		
Skewness	1.67		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.631	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.659	95% H-UCL	0.664
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.744
95% Adjusted-CLT UCL (Chen-1995)	0.672	97.5% Chebyshev (MVUE) UCL	0.809
95% Modified-t UCL (Johnson-1978)	0.662	99% Chebyshev (MVUE) UCL	0.938

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.54	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.032		
MLE of Mean	0.593		
MLE of Standard Deviation	0.138		
nu star	482		
Approximate Chi Square Value (.05)	432.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	0.654
Adjusted Chi Square Value	425.3	95% Jackknife UCL	0.659
		95% Standard Bootstrap UCL	0.652
Anderson-Darling Test Statistic	2.355	95% Bootstrap-t UCL	0.679
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	1.002
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	0.651
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	0.665
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.754
		97.5% Chebyshev(Mean, Sd) UCL	0.824
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.961
95% Approximate Gamma UCL	0.662		
95% Adjusted Gamma UCL	0.672		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.659
	or 95% Modified-t UCL	0.662

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	6.1	Minimum of Log Data	1.808
Maximum	14.9	Maximum of Log Data	2.701
Mean	8.927	Mean of log Data	2.154
Median	8.927	SD of log Data	0.272
SD	2.549		
Coefficient of Variation	0.286		
Skewness	0.99		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.19	95% H-UCL	10.37
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.87
95% Adjusted-CLT UCL (Chen-1995)	10.3	97.5% Chebyshev (MVUE) UCL	13.15
95% Modified-t UCL (Johnson-1978)	10.22	99% Chebyshev (MVUE) UCL	15.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.15	Data appear Normal at 5% Significance Level	
Theta Star	0.8		
MLE of Mean	8.927		
MLE of Standard Deviation	2.673		
nu star	290		
Approximate Chi Square Value (.05)	251.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.09
Adjusted Chi Square Value	246.4	95% Jackknife UCL	10.19
		95% Standard Bootstrap UCL	10.06
Anderson-Darling Test Statistic	0.388	95% Bootstrap-t UCL	10.49
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	10.61
Kolmogorov-Smirnov Test Statistic	0.152	95% Percentile Bootstrap UCL	10.05
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	10.32
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.01
		97.5% Chebyshev(Mean, Sd) UCL	13.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.96
95% Approximate Gamma UCL	10.29		
95% Adjusted Gamma UCL	10.5		

Potential UCL to Use		Use 95% Student's-t UCL	10.19

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.54	Minimum of Log Data	-0.616
Maximum	0.88	Maximum of Log Data	-0.128
Mean	0.657	Mean of log Data	-0.427
Median	0.657	SD of log Data	0.114
SD	0.079		
Coefficient of Variation	0.12		
Skewness	1.666		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.633	Shapiro Wilk Test Statistic	0.664
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.696	95% H-UCL	0.696
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.747
95% Adjusted-CLT UCL (Chen-1995)	0.704	97.5% Chebyshev (MVUE) UCL	0.786
95% Modified-t UCL (Johnson-1978)	0.697	99% Chebyshev (MVUE) UCL	0.863

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	62.59	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0105		
MLE of Mean	0.657		
MLE of Standard Deviation	0.083		
nu star	1627		
Approximate Chi Square Value (.05)	1535	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	0.693
Adjusted Chi Square Value	1522	95% Jackknife UCL	0.696
		95% Standard Bootstrap UCL	0.692
Anderson-Darling Test Statistic	2.371	95% Bootstrap-t UCL	0.707
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	0.88
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	0.691
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	0.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.752
		97.5% Chebyshev(Mean, Sd) UCL	0.793
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.875
95% Approximate Gamma UCL	0.696		
95% Adjusted Gamma UCL	0.702		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.696
	or 95% Modified-t UCL	0.697

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	31.23	Minimum of Log Data	3.441
Maximum	85	Maximum of Log Data	4.443
Mean	62.66	Mean of log Data	4.078
Median	62.66	SD of log Data	0.373
SD	20.96		
Coefficient of Variation	0.334		
Skewness	-0.222		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.02	95% H-UCL	78.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	91.71
95% Adjusted-CLT UCL (Chen-1995)	71.84	97.5% Chebyshev (MVUE) UCL	104.2
95% Modified-t UCL (Johnson-1978)	72.96	99% Chebyshev (MVUE) UCL	128.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.646	Data Follow Appr. Gamma Distribution at 5% Significance Le	
Theta Star	9.429		
MLE of Mean	62.66		
MLE of Standard Deviation	24.31		
nu star	172.8		
Approximate Chi Square Value (.05)	143.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	72.22
Adjusted Chi Square Value	139.6	95% Jackknife UCL	73.02
		95% Standard Bootstrap UCL	71.69
Anderson-Darling Test Statistic	0.716	95% Bootstrap-t UCL	72.82
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	71.2
Kolmogorov-Smirnov Test Statistic	0.238	95% Percentile Bootstrap UCL	72.06
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	71.73
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88
		97.5% Chebyshev(Mean, Sd) UCL	98.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	120.5
95% Approximate Gamma UCL	75.51		
95% Adjusted Gamma UCL	77.57		
Potential UCL to Use		Use 95% Approximate Gamma UCL	75.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	264.4	Minimum of Log Data	5.578
Maximum	822.1	Maximum of Log Data	6.712
Mean	613.8	Mean of log Data	6.369
Median	668	SD of log Data	0.355
SD	175.7		
Coefficient of Variation	0.286		
Skewness	-1.001		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.891	Shapiro Wilk Test Statistic	0.813
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	700.7	95% H-UCL	760.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	888.2
95% Adjusted-CLT UCL (Chen-1995)	679.5	97.5% Chebyshev (MVUE) UCL	1005
95% Modified-t UCL (Johnson-1978)	698.4	99% Chebyshev (MVUE) UCL	1234
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.835	Data appear Normal at 5% Significance Level	
Theta Star	78.35		
MLE of Mean	613.8		
MLE of Standard Deviation	219.3		
nu star	203.7		
Approximate Chi Square Value (.05)	171.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	694
Adjusted Chi Square Value	167.5	95% Jackknife UCL	700.7
		95% Standard Bootstrap UCL	690.4
Anderson-Darling Test Statistic	0.892	95% Bootstrap-t UCL	687.5
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	681.9
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	687.2
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	677.3
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	826.3
		97.5% Chebyshev(Mean, Sd) UCL	918.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1099
95% Approximate Gamma UCL	728.3		
95% Adjusted Gamma UCL	746.5		

Potential UCL to Use		Use 95% Student's-t UCL	700.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0131	Minimum of Log Data	-4.335
Maximum	10	Maximum of Log Data	2.303
Mean	6.997	Mean of log Data	0.789
Median	10	SD of log Data	2.681
SD	4.174		
Coefficient of Variation	0.597		
Skewness	-1.122		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.7	Shapiro Wilk Test Statistic	0.59
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.06	95% H-UCL	10168
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	157.6
95% Adjusted-CLT UCL (Chen-1995)	8.516	97.5% Chebyshev (MVUE) UCL	210.2
95% Modified-t UCL (Johnson-1978)	9	99% Chebyshev (MVUE) UCL	313.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.469	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.93		
MLE of Mean	6.997		
MLE of Standard Deviation	10.22		
nu star	12.18		
Approximate Chi Square Value (.05)	5.348	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	8.901
Adjusted Chi Square Value	4.718	95% Jackknife UCL	9.06
		95% Standard Bootstrap UCL	8.875
Anderson-Darling Test Statistic	2.869	95% Bootstrap-t UCL	8.666
Anderson-Darling 5% Critical Value	0.787	95% Hall's Bootstrap UCL	8.511
Kolmogorov-Smirnov Test Statistic	0.442	95% Percentile Bootstrap UCL	8.764
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	8.524
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.04
		97.5% Chebyshev(Mean, Sd) UCL	14.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.52
95% Approximate Gamma UCL	15.94		
95% Adjusted Gamma UCL	18.07		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	18.52

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	13.91	Maximum of Log Data	2.633
Mean	9.745	Mean of log Data	1.9
Median	10	SD of log Data	1.628
SD	3.153		
Coefficient of Variation	0.324		
Skewness	-2.612		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.608	Shapiro Wilk Test Statistic	0.362
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.3	95% H-UCL	166.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.36
95% Adjusted-CLT UCL (Chen-1995)	10.51	97.5% Chebyshev (MVUE) UCL	86.08
95% Modified-t UCL (Johnson-1978)	11.2	99% Chebyshev (MVUE) UCL	124.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.184	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.23		
MLE of Mean	9.745		
MLE of Standard Deviation	8.956		
nu star	30.79		
Approximate Chi Square Value (.05)	19.11	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	11.18
Adjusted Chi Square Value	17.81	95% Jackknife UCL	11.3
		95% Standard Bootstrap UCL	11.13
Anderson-Darling Test Statistic	3.846	95% Bootstrap-t UCL	10.85
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	10.71
Kolmogorov-Smirnov Test Statistic	0.532	95% Percentile Bootstrap UCL	10.89
Kolmogorov-Smirnov 5% Critical Value	0.241	95% BCA Bootstrap UCL	10.67
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.56
		97.5% Chebyshev(Mean, Sd) UCL	15.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.45
95% Approximate Gamma UCL	15.7		
95% Adjusted Gamma UCL	16.84		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	18.45

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	3.65	Minimum of Log Data	1.295
Maximum	33.64	Maximum of Log Data	3.516
Mean	16.67	Mean of log Data	2.622
Median	20	SD of log Data	0.741
SD	8.396		
Coefficient of Variation	0.504		
Skewness	-0.191		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.717
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20.82	95% H-UCL	30.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.26
95% Adjusted-CLT UCL (Chen-1995)	20.37	97.5% Chebyshev (MVUE) UCL	41.45
95% Modified-t UCL (Johnson-1978)	20.8	99% Chebyshev (MVUE) UCL	55.57

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.178	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.655		
MLE of Mean	16.67		
MLE of Standard Deviation	11.3		
nu star	56.63		
Approximate Chi Square Value (.05)	40.33	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	20.5
Adjusted Chi Square Value	38.38	95% Jackknife UCL	20.82
		95% Standard Bootstrap UCL	20.28
Anderson-Darling Test Statistic	1.734	95% Bootstrap-t UCL	20.53
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	20.84
Kolmogorov-Smirnov Test Statistic	0.349	95% Percentile Bootstrap UCL	20.3
Kolmogorov-Smirnov 5% Critical Value	0.239	95% BCA Bootstrap UCL	20.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.82
		97.5% Chebyshev(Mean, Sd) UCL	31.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	39.84
95% Approximate Gamma UCL	23.41		
95% Adjusted Gamma UCL	24.6		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	26.82

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.91	Minimum of Log Data	-0.0943
Maximum	1.42	Maximum of Log Data	0.351
Mean	1.183	Mean of log Data	0.165
Median	1.183	SD of log Data	0.0926
SD	0.105		
Coefficient of Variation	0.0887		
Skewness	-0.607		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.6
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.235	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.316
95% Adjusted-CLT UCL (Chen-1995)	1.226	97.5% Chebyshev (MVUE) UCL	1.374
95% Modified-t UCL (Johnson-1978)	1.234	99% Chebyshev (MVUE) UCL	1.486

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	100.6	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0118		
MLE of Mean	1.183		
MLE of Standard Deviation	0.118		
nu star	2615		
Approximate Chi Square Value (.05)	2497	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	1.231
Adjusted Chi Square Value	2480	95% Jackknife UCL	1.235
		95% Standard Bootstrap UCL	1.23
Anderson-Darling Test Statistic	2.741	95% Bootstrap-t UCL	1.226
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	1.237
Kolmogorov-Smirnov Test Statistic	0.435	95% Percentile Bootstrap UCL	1.225
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	1.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.31
		97.5% Chebyshev(Mean, Sd) UCL	1.365
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.473
95% Approximate Gamma UCL	1.239		
95% Adjusted Gamma UCL	1.247		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.235
	or 95% Modified-t UCL	1.234

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	25.6	Minimum of Log Data	3.243
Maximum	42.5	Maximum of Log Data	3.75
Mean	33.77	Mean of log Data	3.515
Median	33.77	SD of log Data	0.104
SD	3.456		
Coefficient of Variation	0.102		
Skewness	0.289		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.597	Shapiro Wilk Test Statistic	0.593
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.47	95% H-UCL	35.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.02
95% Adjusted-CLT UCL (Chen-1995)	35.43	97.5% Chebyshev (MVUE) UCL	39.85
95% Modified-t UCL (Johnson-1978)	35.49	99% Chebyshev (MVUE) UCL	43.46

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	78.58	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.43		
MLE of Mean	33.77		
MLE of Standard Deviation	3.809		
nu star	2043		
Approximate Chi Square Value (.05)	1939	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	35.34
Adjusted Chi Square Value	1925	95% Jackknife UCL	35.47
		95% Standard Bootstrap UCL	35.28
Anderson-Darling Test Statistic	2.883	95% Bootstrap-t UCL	35.35
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	36.09
Kolmogorov-Smirnov Test Statistic	0.41	95% Percentile Bootstrap UCL	35.11
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	35.11
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37.94
		97.5% Chebyshev(Mean, Sd) UCL	39.75
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.3
95% Approximate Gamma UCL	35.58		
95% Adjusted Gamma UCL	35.84		

Potential UCL to Use		
	Use 95% Student's-t UCL	35.47
	or 95% Modified-t UCL	35.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.46	Minimum of Log Data	-0.777
Maximum	0.69	Maximum of Log Data	-0.371
Mean	0.575	Mean of log Data	-0.556
Median	0.575	SD of log Data	0.072
SD	0.0407		
Coefficient of Variation	0.0707		
Skewness	2.29E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.494	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.592	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.619
95% Adjusted-CLT UCL (Chen-1995)	0.591	97.5% Chebyshev (MVUE) UCL	0.638
95% Modified-t UCL (Johnson-1978)	0.592	99% Chebyshev (MVUE) UCL	0.675

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	171.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00335		
MLE of Mean	0.575		
MLE of Standard Deviation	0.0439		
nu star	5836		
Approximate Chi Square Value (.05)	5660	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.591
Adjusted Chi Square Value	5641	95% Jackknife UCL	0.592
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.552	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.618
		97.5% Chebyshev(Mean, Sd) UCL	0.637
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.673
95% Approximate Gamma UCL	0.593		
95% Adjusted Gamma UCL	0.595		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.592
	or 95% Modified-t UCL	0.592

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	8.46	Minimum of Log Data	2.135
Maximum	28.55	Maximum of Log Data	3.352
Mean	12.55	Mean of log Data	2.489
Median	12.55	SD of log Data	0.268
SD	4.447		
Coefficient of Variation	0.354		
Skewness	3.168		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.43	95% H-UCL	14.13
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.03
95% Adjusted-CLT UCL (Chen-1995)	15.21	97.5% Chebyshev (MVUE) UCL	17.58
95% Modified-t UCL (Johnson-1978)	14.57	99% Chebyshev (MVUE) UCL	20.61

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.45	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.2		
MLE of Mean	12.55		
MLE of Standard Deviation	3.881		
nu star	355.4		
Approximate Chi Square Value (.05)	312.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	14.32
Adjusted Chi Square Value	308.6	95% Jackknife UCL	14.43
		95% Standard Bootstrap UCL	14.24
Anderson-Darling Test Statistic	1.691	95% Bootstrap-t UCL	16.33
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	22.3
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	14.56
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	15.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.25
		97.5% Chebyshev(Mean, Sd) UCL	19.28
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.28
95% Approximate Gamma UCL	14.26		
95% Adjusted Gamma UCL	14.45		

Potential UCL to Use		
	Use 95% Student's-t UCL	14.43
	or 95% Modified-t UCL	14.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.04	Log Statistics Not Avaliable
Maximum	0.327	
Mean	0.165	
Median	0.165	
SD	0.0662	
Coefficient of Variation	0.402	
Skewness	-1.032	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.55	Not Available
Shapiro Wilk Critical Value	0.892	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.193	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.193	95% Adjusted-CLT UCL (Chen 1995)		0.187
		95% Modified-t UCL (Johnson-1978)		0.192

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.235	95% CLT UCL	0.191
		95% Jackknife UCL	0.193
		95% Standard Bootstrap UCL	0.191
		95% Bootstrap-t UCL	0.188
		95% Hall's Bootstrap UCL	0.193
		95% Percentile Bootstrap UCL	0.189
		95% BCA Bootstrap UCL	0.186
		95% Chebyshev(Mean, Sd) UCL	0.235
		97.5% Chebyshev(Mean, Sd) UCL	0.265
		99% Chebyshev(Mean, Sd) UCL	0.324

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	11.6	Minimum of Log Data	2.451
Maximum	85	Maximum of Log Data	4.443
Mean	46.38	Mean of log Data	3.746
Median	46.38	SD of log Data	0.485
SD	18.16		
Coefficient of Variation	0.392		
Skewness	0.513		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.788	Shapiro Wilk Test Statistic	0.734
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.07	95% H-UCL	60.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.29
95% Adjusted-CLT UCL (Chen-1995)	54.21	97.5% Chebyshev (MVUE) UCL	83.12
95% Modified-t UCL (Johnson-1978)	54.16	99% Chebyshev (MVUE) UCL	104.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.689	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.891		
MLE of Mean	46.38		
MLE of Standard Deviation	21.42		
nu star	159.4		
Approximate Chi Square Value (.05)	131.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	53.62
Adjusted Chi Square Value	128.6	95% Jackknife UCL	54.07
		95% Standard Bootstrap UCL	53.16
Anderson-Darling Test Statistic	1.976	95% Bootstrap-t UCL	55.31
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	60.69
Kolmogorov-Smirnov Test Statistic	0.28	95% Percentile Bootstrap UCL	53.43
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	53.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	65.57
		97.5% Chebyshev(Mean, Sd) UCL	73.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	90.2
95% Approximate Gamma UCL	56.34		
95% Adjusted Gamma UCL	57.51		

Potential UCL to Use		
	Use 95% Student's-t UCL	54.07
	or 95% Modified-t UCL	54.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	12.5	Minimum of Log Data	2.526
Maximum	66.58	Maximum of Log Data	4.198
Mean	58.05	Mean of log Data	4.015
Median	58.05	SD of log Data	0.387
SD	12.17		
Coefficient of Variation	0.21		
Skewness	-3.629		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.49	Shapiro Wilk Test Statistic	0.375
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.21	95% H-UCL	72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	84.28
95% Adjusted-CLT UCL (Chen-1995)	60.13	97.5% Chebyshev (MVUE) UCL	95.03
95% Modified-t UCL (Johnson-1978)	62.77	99% Chebyshev (MVUE) UCL	116.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.016	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.439		
MLE of Mean	58.05		
MLE of Standard Deviation	19.33		
nu star	306.5		
Approximate Chi Square Value (.05)	267	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	62.91
Adjusted Chi Square Value	263.1	95% Jackknife UCL	63.21
		95% Standard Bootstrap UCL	62.63
Anderson-Darling Test Statistic	4.10E+00	95% Bootstrap-t UCL	61.46
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	61.2
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	61.74
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	61.18
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.92
		97.5% Chebyshev(Mean, Sd) UCL	76.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	87.43
95% Approximate Gamma UCL	66.65		
95% Adjusted Gamma UCL	67.63		

Potential UCL to Use		
	Use 95% Student's-t UCL	63.21
	or 95% Modified-t UCL	62.77

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0181	Minimum of Log Data	-4.012
Maximum	0.041	Maximum of Log Data	-3.194
Mean	0.032	Mean of log Data	-3.452
Median	0.032	SD of log Data	0.159
SD	0.00432		
Coefficient of Variation	0.135		
Skewness	-1.631		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.565	Shapiro Wilk Test Statistic	0.507
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0339	95% H-UCL	0.0344
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0375
95% Adjusted-CLT UCL (Chen-1995)	0.0333	97.5% Chebyshev (MVUE) UCL	0.0398
95% Modified-t UCL (Johnson-1978)	0.0338	99% Chebyshev (MVUE) UCL	0.0444

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	39.08	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.20E-04		
MLE of Mean	0.032		
MLE of Standard Deviation	0.00512		
nu star	1329		
Approximate Chi Square Value (.05)	1245	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.0338
Adjusted Chi Square Value	1237	95% Jackknife UCL	0.0339
		95% Standard Bootstrap UCL	0.0337
Anderson-Darling Test Statistic	3.885	95% Bootstrap-t UCL	0.0336
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	0.0337
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	0.0336
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	0.0334
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0366
		97.5% Chebyshev(Mean, Sd) UCL	0.0386
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0425
95% Approximate Gamma UCL	0.0342		
95% Adjusted Gamma UCL	0.0344		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0339
	or 95% Modified-t UCL	0.0338

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.8	Minimum of Log Data	-0.223
Maximum	1.31	Maximum of Log Data	0.27
Mean	1.12	Mean of log Data	0.109
Median	1.12	SD of log Data	0.0967
SD	0.0986		
Coefficient of Variation	0.088		
Skewness	-1.755		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.563	Shapiro Wilk Test Statistic	0.528
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	1.162	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		1.235
95% Adjusted-CLT UCL (Chen-1995)	1.148	97.5% Chebyshev (MVUE) UCL		1.285
95% Modified-t UCL (Johnson-1978)	1.16	99% Chebyshev (MVUE) UCL		1.382

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	100.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0112		
MLE of Mean	1.12		
MLE of Standard Deviation	0.112		
nu star	3408		
Approximate Chi Square Value (.05)	3273	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	1.159
Adjusted Chi Square Value	3260	95% Jackknife UCL	1.162
		95% Standard Bootstrap UCL	1.159
Anderson-Darling Test Statistic	3.811	95% Bootstrap-t UCL	1.155
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	1.155
Kolmogorov-Smirnov Test Statistic	0.453	95% Percentile Bootstrap UCL	1.154
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	1.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.224
		97.5% Chebyshev(Mean, Sd) UCL	1.269
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.358
95% Approximate Gamma UCL	1.166		
95% Adjusted Gamma UCL	1.171		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.162
	or 95% Modified-t UCL	1.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-04.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Aluminum

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	4600	Minimum of Log Data	8.434
Maximum	13000	Maximum of Log Data	9.473
Mean	7983	Mean of log Data	8.969
Median	7983	SD of log Data	0.186
SD	1455		
Coefficient of Variation	0.182		
Skewness	1.057		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.57
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8503	95% H-UCL	8569
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9344
95% Adjusted-CLT UCL (Chen-1995)	8553	97.5% Chebyshev (MVUE) UCL	9931
95% Modified-t UCL (Johnson-1978)	8515	99% Chebyshev (MVUE) UCL	11084

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	27.41	Data do not follow a Discernable Distribution (0.05)	
Theta Star	291.3		
MLE of Mean	7983		
MLE of Standard Deviation	1525		
nu star	1261		
Approximate Chi Square Value (.05)	1179	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	8481
Adjusted Chi Square Value	1174	95% Jackknife UCL	8503
		95% Standard Bootstrap UCL	8464
Anderson-Darling Test Statistic	5.147	95% Bootstrap-t UCL	8534
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	8964
Kolmogorov-Smirnov Test Statistic	0.437	95% Percentile Bootstrap UCL	8511
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	8528
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9305
		97.5% Chebyshev(Mean, Sd) UCL	9877
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11001
95% Approximate Gamma UCL	8534		
95% Adjusted Gamma UCL	8575		

Potential UCL to Use		
	Use 95% Student's-t UCL	8503
	or 95% Modified-t UCL	8515

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	3.2	Minimum of Log Data	1.163
Maximum	16	Maximum of Log Data	2.773
Mean	9.231	Mean of log Data	2.171
Median	10.54	SD of log Data	0.348
SD	2.791		
Coefficient of Variation	0.302		
Skewness	-0.0564		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.23	95% H-UCL	10.69
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.28
95% Adjusted-CLT UCL (Chen-1995)	10.18	97.5% Chebyshev (MVUE) UCL	13.58
95% Modified-t UCL (Johnson-1978)	10.23	99% Chebyshev (MVUE) UCL	16.13
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.573	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.077		
MLE of Mean	9.231		
MLE of Standard Deviation	3.153		
nu star	394.4		
Approximate Chi Square Value (.05)	349.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.19
Adjusted Chi Square Value	346.3	95% Jackknife UCL	10.23
		95% Standard Bootstrap UCL	10.16
Anderson-Darling Test Statistic	1.336	95% Bootstrap-t UCL	10.21
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	10.25
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	10.14
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	10.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.77
		97.5% Chebyshev(Mean, Sd) UCL	12.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.02
95% Approximate Gamma UCL	10.42		
95% Adjusted Gamma UCL	10.51		
Potential UCL to Use		Use 95% Student's-t UCL	10.23
		or 95% Modified-t UCL	10.23

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	0.92	Maximum of Log Data	-0.0834
Mean	0.553	Mean of log Data	-0.606
Median	0.553	SD of log Data	0.163
SD	0.0955		
Coefficient of Variation	0.173		
Skewness	2.122		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.483	Shapiro Wilk Test Statistic	0.523
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.587	95% H-UCL	0.587
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.634
95% Adjusted-CLT UCL (Chen-1995)	0.595	97.5% Chebyshev (MVUE) UCL	0.67
95% Modified-t UCL (Johnson-1978)	0.588	99% Chebyshev (MVUE) UCL	0.739

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	33.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0163		
MLE of Mean	0.553		
MLE of Standard Deviation	0.0949		
nu star	1558		
Approximate Chi Square Value (.05)	1467	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.585
Adjusted Chi Square Value	1461	95% Jackknife UCL	0.587
		95% Standard Bootstrap UCL	0.584
Anderson-Darling Test Statistic	5.633	95% Bootstrap-t UCL	0.594
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.778
Kolmogorov-Smirnov Test Statistic	0.435	95% Percentile Bootstrap UCL	0.588
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.639
		97.5% Chebyshev(Mean, Sd) UCL	0.677
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.751
95% Approximate Gamma UCL	0.587		
95% Adjusted Gamma UCL	0.589		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.587
	or 95% Modified-t UCL	0.588

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics
Minimum	-0.01	Log Statistics Not Avaliable
Maximum	0.348	
Mean	0.0853	
Median	0.0853	
SD	0.0648	
Coefficient of Variation	0.76	
Skewness	2.944	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.481	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.108	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.108	95% Adjusted-CLT UCL (Chen 1995)	0.116
		95% Modified-t UCL (Johnson-1978)	0.11

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.144	95% CLT UCL	0.107
		95% Jackknife UCL	0.108
		95% Standard Bootstrap UCL	0.107
		95% Bootstrap-t UCL	0.118
		95% Hall's Bootstrap UCL	0.218
		95% Percentile Bootstrap UCL	0.108
		95% BCA Bootstrap UCL	0.12
		95% Chebyshev(Mean, Sd) UCL	0.144
		97.5% Chebyshev(Mean, Sd) UCL	0.17
		99% Chebyshev(Mean, Sd) UCL	0.22

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	8.4	Minimum of Log Data	2.128
Maximum	85	Maximum of Log Data	4.443
Mean	50.47	Mean of log Data	3.761
Median	48.41	SD of log Data	0.656
SD	24.59		
Coefficient of Variation	0.487		
Skewness	0.12		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	59.28	95% H-UCL	71.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.2
95% Adjusted-CLT UCL (Chen-1995)	59.04	97.5% Chebyshev (MVUE) UCL	100.7
95% Modified-t UCL (Johnson-1978)	59.3	99% Chebyshev (MVUE) UCL	129.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.87	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	17.59		
MLE of Mean	50.47		
MLE of Standard Deviation	29.79		
nu star	132		
Approximate Chi Square Value (.05)	106.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	58.91
Adjusted Chi Square Value	104.8	95% Jackknife UCL	59.28
		95% Standard Bootstrap UCL	58.76
Anderson-Darling Test Statistic	0.933	95% Bootstrap-t UCL	59.8
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	58.99
Kolmogorov-Smirnov Test Statistic	0.156	95% Percentile Bootstrap UCL	58.64
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	58.86
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.82
		97.5% Chebyshev(Mean, Sd) UCL	82.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	101.5
95% Approximate Gamma UCL	62.58		
95% Adjusted Gamma UCL	63.57		

Potential UCL to Use		Use 95% Approximate Gamma UCL	62.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	23

Raw Statistics		Log-transformed Statistics	
Minimum	8373	Minimum of Log Data	9.033
Maximum	46653	Maximum of Log Data	10.75
Mean	15643	Mean of log Data	9.594
Median	14655	SD of log Data	0.331
SD	7342		
Coefficient of Variation	0.469		
Skewness	3.631		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.594	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18271	95% H-UCL	17655
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20200
95% Adjusted-CLT UCL (Chen-1995)	19399	97.5% Chebyshev (MVUE) UCL	22249
95% Modified-t UCL (Johnson-1978)	18465	99% Chebyshev (MVUE) UCL	26275

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.981	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2241		
MLE of Mean	15643		
MLE of Standard Deviation	5920		
nu star	321.1		
Approximate Chi Square Value (.05)	280.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	18161
Adjusted Chi Square Value	277.9	95% Jackknife UCL	18271
		95% Standard Bootstrap UCL	18091
Anderson-Darling Test Statistic	1.311	95% Bootstrap-t UCL	20850
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	28864
Kolmogorov-Smirnov Test Statistic	0.225	95% Percentile Bootstrap UCL	18420
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	20050
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22316
		97.5% Chebyshev(Mean, Sd) UCL	25203
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30875
95% Approximate Gamma UCL	17901		
95% Adjusted Gamma UCL	18078		

Potential UCL to Use		
	Use 95% Student's-t UCL	18271
	or 95% Modified-t UCL	18465

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	23

Raw Statistics		Log-transformed Statistics	
Minimum	125.3	Minimum of Log Data	4.831
Maximum	1130	Maximum of Log Data	7.03
Mean	387.6	Mean of log Data	5.814
Median	324.4	SD of log Data	0.529
SD	243		
Coefficient of Variation	0.627		
Skewness	1.78		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.794	Shapiro Wilk Test Statistic	0.951
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	474.6	95% H-UCL	482.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	574.3
95% Adjusted-CLT UCL (Chen-1995)	491	97.5% Chebyshev (MVUE) UCL	657.3
95% Modified-t UCL (Johnson-1978)	477.7	99% Chebyshev (MVUE) UCL	820.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.136	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	123.6		
MLE of Mean	387.6		
MLE of Standard Deviation	218.9		
nu star	144.3		
Approximate Chi Square Value (.05)	117.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	470.9
Adjusted Chi Square Value	115.8	95% Jackknife UCL	474.6
		95% Standard Bootstrap UCL	471.1
Anderson-Darling Test Statistic	0.887	95% Bootstrap-t UCL	508.4
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	494.9
Kolmogorov-Smirnov Test Statistic	0.178	95% Percentile Bootstrap UCL	474.2
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	496.1
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	608.5
		97.5% Chebyshev(Mean, Sd) UCL	704.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	891.8
95% Approximate Gamma UCL	475.8		
95% Adjusted Gamma UCL	483		

Potential UCL to Use		Use 95% Approximate Gamma UCL	475.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0088	Minimum of Log Data	-4.733
Maximum	10	Maximum of Log Data	2.303
Mean	8.218	Mean of log Data	1.215
Median	10	SD of log Data	2.418
SD	3.852		
Coefficient of Variation	0.469		
Skewness	-1.83		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.482	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.597	95% H-UCL	729.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	163
95% Adjusted-CLT UCL (Chen-1995)	9.211	97.5% Chebyshev (MVUE) UCL	215.1
95% Modified-t UCL (Johnson-1978)	9.546	99% Chebyshev (MVUE) UCL	317.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.621	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.23		
MLE of Mean	8.218		
MLE of Standard Deviation	10.43		
nu star	28.56		
Approximate Chi Square Value (.05)	17.37	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	9.539
Adjusted Chi Square Value	16.74	95% Jackknife UCL	9.597
		95% Standard Bootstrap UCL	9.466
Anderson-Darling Test Statistic	7.021	95% Bootstrap-t UCL	9.292
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	9.199
Kolmogorov-Smirnov Test Statistic	0.509	95% Percentile Bootstrap UCL	9.472
Kolmogorov-Smirnov 5% Critical Value	0.19	95% BCA Bootstrap UCL	9.132
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.72
		97.5% Chebyshev(Mean, Sd) UCL	13.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.21
95% Approximate Gamma UCL	13.52		
95% Adjusted Gamma UCL	14.03		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	13.23
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	7.5	Minimum of Log Data	2.015
Maximum	104	Maximum of Log Data	4.644
Mean	63.23	Mean of log Data	4.044
Median	65	SD of log Data	0.582
SD	20.15		
Coefficient of Variation	0.319		
Skewness	-1.241		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk Test Statistic	0.557
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.45	95% H-UCL	87.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.2
95% Adjusted-CLT UCL (Chen-1995)	68.98	97.5% Chebyshev (MVUE) UCL	120.3
95% Modified-t UCL (Johnson-1978)	70.26	99% Chebyshev (MVUE) UCL	152

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.381	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.43		
MLE of Mean	63.23		
MLE of Standard Deviation	30.21		
nu star	201.5		
Approximate Chi Square Value (.05)	169.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	70.14
Adjusted Chi Square Value	167.6	95% Jackknife UCL	70.45
		95% Standard Bootstrap UCL	69.76
Anderson-Darling Test Statistic	3.727	95% Bootstrap-t UCL	69.44
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	69.23
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL	69.91
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	69.09
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.54
		97.5% Chebyshev(Mean, Sd) UCL	89.47
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105
95% Approximate Gamma UCL	75.1		
95% Adjusted Gamma UCL	76.05		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	81.54

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.038	Minimum of Log Data	-3.27
Maximum	12.35	Maximum of Log Data	2.514
Mean	9.002	Mean of log Data	1.605
Median	10	SD of log Data	1.928
SD	3.604		
Coefficient of Variation	0.4		
Skewness	-2.197		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.426
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.29	95% H-UCL	160.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	84.8
95% Adjusted-CLT UCL (Chen-1995)	9.87	97.5% Chebyshev (MVUE) UCL	110.1
95% Modified-t UCL (Johnson-1978)	10.23	99% Chebyshev (MVUE) UCL	159.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.878	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.25		
MLE of Mean	9.002		
MLE of Standard Deviation	9.605		
nu star	40.4		
Approximate Chi Square Value (.05)	26.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.24
Adjusted Chi Square Value	26.04	95% Jackknife UCL	10.29
		95% Standard Bootstrap UCL	10.21
Anderson-Darling Test Statistic	7.015	95% Bootstrap-t UCL	10.02
Anderson-Darling 5% Critical Value	0.771	95% Hall's Bootstrap UCL	9.944
Kolmogorov-Smirnov Test Statistic	0.541	95% Percentile Bootstrap UCL	10.05
Kolmogorov-Smirnov 5% Critical Value	0.187	95% BCA Bootstrap UCL	9.939
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.28
		97.5% Chebyshev(Mean, Sd) UCL	13.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.48
95% Approximate Gamma UCL	13.55		
95% Adjusted Gamma UCL	13.97		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0073	Minimum of Log Data	-4.92
Maximum	0.073	Maximum of Log Data	-2.618
Mean	0.0242	Mean of log Data	-3.819
Median	0.0242	SD of log Data	0.465
SD	0.012		
Coefficient of Variation	0.496		
Skewness	2.964		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.477	Shapiro Wilk Test Statistic	0.579
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0285	95% H-UCL	0.0296
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0349
95% Adjusted-CLT UCL (Chen-1995)	0.03	97.5% Chebyshev (MVUE) UCL	0.0395
95% Modified-t UCL (Johnson-1978)	0.0287	99% Chebyshev (MVUE) UCL	0.0486

Gamma Distribution Test		Data Distribution
k star (bias corrected)	4.622	Data do not follow a Discernable Distribution (0.05)
Theta Star	0.00523	
MLE of Mean	0.0242	
MLE of Standard Deviation	0.0113	
nu star	212.6	
Approximate Chi Square Value (.05)	179.9	Nonparametric Statistics
Adjusted Level of Significance	0.0389	95% CLT UCL 0.0283
Adjusted Chi Square Value	177.7	95% Jackknife UCL 0.0285
		95% Standard Bootstrap UCL 0.0283
Anderson-Darling Test Statistic	5.109	95% Bootstrap-t UCL 0.0304
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL 0.0487
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL 0.0284
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL 0.0299
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 0.0351
		97.5% Chebyshev(Mean, Sd) UCL 0.0398
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 0.0491
95% Approximate Gamma UCL	0.0286	
95% Adjusted Gamma UCL	0.0289	

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0285
	or 95% Modified-t UCL	0.0287

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.573	Minimum of Log Data	-0.557
Maximum	1.73	Maximum of Log Data	0.548
Mean	0.953	Mean of log Data	-0.0648
Median	0.953	SD of log Data	0.184
SD	0.195		
Coefficient of Variation	0.205		
Skewness	2.622		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.493	Shapiro Wilk Test Statistic	0.558
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.023	95% H-UCL	1.021
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.112
95% Adjusted-CLT UCL (Chen-1995)	1.044	97.5% Chebyshev (MVUE) UCL	1.181
95% Modified-t UCL (Johnson-1978)	1.027	99% Chebyshev (MVUE) UCL	1.317

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.86	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0369		
MLE of Mean	0.953		
MLE of Standard Deviation	0.187		
nu star	1190		
Approximate Chi Square Value (.05)	1111	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	1.02
Adjusted Chi Square Value	1105	95% Jackknife UCL	1.023
		95% Standard Bootstrap UCL	1.019
Anderson-Darling Test Statistic	5.15	95% Bootstrap-t UCL	1.048
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	1.38
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	1.022
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	1.043
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.131
		97.5% Chebyshev(Mean, Sd) UCL	1.207
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.358
95% Approximate Gamma UCL	1.021		
95% Adjusted Gamma UCL	1.026		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.023
	or 95% Modified-t UCL	1.027

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	14.7	Minimum of Log Data	2.688
Maximum	47.5	Maximum of Log Data	3.861
Mean	28.85	Mean of log Data	3.347
Median	28.85	SD of log Data	0.185
SD	5.146		
Coefficient of Variation	0.178		
Skewness	1.266		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.506
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30.69	95% H-UCL	30.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.74
95% Adjusted-CLT UCL (Chen-1995)	30.92	97.5% Chebyshev (MVUE) UCL	35.85
95% Modified-t UCL (Johnson-1978)	30.74	99% Chebyshev (MVUE) UCL	39.99

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	28.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.019		
MLE of Mean	28.85		
MLE of Standard Deviation	5.423		
nu star	1302		
Approximate Chi Square Value (.05)	1219	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	30.62
Adjusted Chi Square Value	1213	95% Jackknife UCL	30.69
		95% Standard Bootstrap UCL	30.6
Anderson-Darling Test Statistic	5.582	95% Bootstrap-t UCL	30.8
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	32.61
Kolmogorov-Smirnov Test Statistic	0.436	95% Percentile Bootstrap UCL	30.67
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	30.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.53
		97.5% Chebyshev(Mean, Sd) UCL	35.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	39.53
95% Approximate Gamma UCL	30.81		
95% Adjusted Gamma UCL	30.96		

Potential UCL to Use		
	Use 95% Student's-t UCL	30.69
	or 95% Modified-t UCL	30.74

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	5380	Minimum of Log Data	8.59
Maximum	15200	Maximum of Log Data	9.629
Mean	8705	Mean of log Data	9.055
Median	8705	SD of log Data	0.181
SD	1752		
Coefficient of Variation	0.201		
Skewness	2.489		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.533	Shapiro Wilk Test Statistic	0.6
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9382	95% H-UCL	9369
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10236
95% Adjusted-CLT UCL (Chen-1995)	9582	97.5% Chebyshev (MVUE) UCL	10901
95% Modified-t UCL (Johnson-1978)	9419	99% Chebyshev (MVUE) UCL	12209

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.21	Data do not follow a Discernable Distribution (0.05)	
Theta Star	332.1		
MLE of Mean	8705		
MLE of Standard Deviation	1700		
nu star	1049		
Approximate Chi Square Value (.05)	974.4	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	9349
Adjusted Chi Square Value	968.7	95% Jackknife UCL	9382
		95% Standard Bootstrap UCL	9340
Anderson-Darling Test Statistic	4.074	95% Bootstrap-t UCL	9616
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	12804
Kolmogorov-Smirnov Test Statistic	0.426	95% Percentile Bootstrap UCL	9355
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	9609
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10413
		97.5% Chebyshev(Mean, Sd) UCL	11152
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12603
95% Approximate Gamma UCL	9368		
95% Adjusted Gamma UCL	9422		

Potential UCL to Use		
	Use 95% Student's-t UCL	9382
	or 95% Modified-t UCL	9419

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	20	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	4	Minimum of Log Data	1.386
Maximum	13.45	Maximum of Log Data	2.599
Mean	8.758	Mean of log Data	2.128
Median	8.3	SD of log Data	0.307
SD	2.466		
Coefficient of Variation	0.282		
Skewness	-0.0692		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.711	95% H-UCL	10.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.45
95% Adjusted-CLT UCL (Chen-1995)	9.655	97.5% Chebyshev (MVUE) UCL	12.6
95% Modified-t UCL (Johnson-1978)	9.709	99% Chebyshev (MVUE) UCL	14.87

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.32	Data appear Normal at 5% Significance Level	
Theta Star	0.849		
MLE of Mean	8.758		
MLE of Standard Deviation	2.726		
nu star	412.7		
Approximate Chi Square Value (.05)	366.6	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	9.664
Adjusted Chi Square Value	363.2	95% Jackknife UCL	9.711
		95% Standard Bootstrap UCL	9.653
Anderson-Darling Test Statistic	0.649	95% Bootstrap-t UCL	9.668
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	9.611
Kolmogorov-Smirnov Test Statistic	0.221	95% Percentile Bootstrap UCL	9.624
Kolmogorov-Smirnov 5% Critical Value	0.194	95% BCA Bootstrap UCL	9.647
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.16
		97.5% Chebyshev(Mean, Sd) UCL	12.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.24
95% Approximate Gamma UCL	9.859		
95% Adjusted Gamma UCL	9.952		

Potential UCL to Use		Use 95% Student's-t UCL	9.711

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.38	Minimum of Log Data	-0.968
Maximum	0.8	Maximum of Log Data	-0.223
Mean	0.6	Mean of log Data	-0.518
Median	0.6	SD of log Data	0.124
SD	0.0684		
Coefficient of Variation	0.114		
Skewness	-0.483		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.474	Shapiro Wilk Test Statistic	0.452
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.626	95% H-UCL	0.631
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.673
95% Adjusted-CLT UCL (Chen-1995)	0.623	97.5% Chebyshev (MVUE) UCL	0.704
95% Modified-t UCL (Johnson-1978)	0.626	99% Chebyshev (MVUE) UCL	0.766

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	62.54	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00959		
MLE of Mean	0.6		
MLE of Standard Deviation	0.0759		
nu star	2502		
Approximate Chi Square Value (.05)	2387	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	0.625
Adjusted Chi Square Value	2378	95% Jackknife UCL	0.626
		95% Standard Bootstrap UCL	0.625
Anderson-Darling Test Statistic	5.369	95% Bootstrap-t UCL	0.622
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.629
Kolmogorov-Smirnov Test Statistic	0.466	95% Percentile Bootstrap UCL	0.622
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	0.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.667
		97.5% Chebyshev(Mean, Sd) UCL	0.695
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.752
95% Approximate Gamma UCL	0.629		
95% Adjusted Gamma UCL	0.631		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.626
	or 95% Modified-t UCL	0.626

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	85	Maximum of Log Data	4.443
Mean	54.25	Mean of log Data	3.857
Median	44.1	SD of log Data	0.595
SD	25.3		
Coefficient of Variation	0.466		
Skewness	0.0842		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.03	95% H-UCL	75.42
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.98
95% Adjusted-CLT UCL (Chen-1995)	63.67	97.5% Chebyshev (MVUE) UCL	104.7
95% Modified-t UCL (Johnson-1978)	64.05	99% Chebyshev (MVUE) UCL	133.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.276	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.56		
MLE of Mean	54.25		
MLE of Standard Deviation	29.97		
nu star	131		
Approximate Chi Square Value (.05)	105.6	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	63.55
Adjusted Chi Square Value	103.8	95% Jackknife UCL	64.03
		95% Standard Bootstrap UCL	63.27
Anderson-Darling Test Statistic	1.044	95% Bootstrap-t UCL	64.4
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	63.07
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	63.38
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	63.54
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.91
		97.5% Chebyshev(Mean, Sd) UCL	89.58
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.5
95% Approximate Gamma UCL	67.32		
95% Adjusted Gamma UCL	68.49		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	78.91

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	113.8	Minimum of Log Data	4.734
Maximum	4146	Maximum of Log Data	8.33
Mean	525.1	Mean of log Data	5.759
Median	290.5	SD of log Data	0.852
SD	882.7		
Coefficient of Variation	1.681		
Skewness	4.013		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.439	Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	866.4	95% H-UCL	732.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	849.1
95% Adjusted-CLT UCL (Chen-1995)	1039	97.5% Chebyshev (MVUE) UCL	1024
95% Modified-t UCL (Johnson-1978)	895.9	99% Chebyshev (MVUE) UCL	1367

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.992	Data do not follow a Discernable Distribution (0.05)	
Theta Star	529.1		
MLE of Mean	525.1		
MLE of Standard Deviation	527.1		
nu star	39.69		
Approximate Chi Square Value (.05)	26.26	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	849.8
Adjusted Chi Square Value	25.4	95% Jackknife UCL	866.4
		95% Standard Bootstrap UCL	836.9
Anderson-Darling Test Statistic	1.693	95% Bootstrap-t UCL	2003
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	2095
Kolmogorov-Smirnov Test Statistic	0.24	95% Percentile Bootstrap UCL	892.8
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	1095
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1385
		97.5% Chebyshev(Mean, Sd) UCL	1758
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2489
95% Approximate Gamma UCL	793.7		
95% Adjusted Gamma UCL	820.7		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1385

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0182	Minimum of Log Data	-4.006
Maximum	10	Maximum of Log Data	2.303
Mean	7.944	Mean of log Data	1.181
Median	10	SD of log Data	2.303
SD	4.062		
Coefficient of Variation	0.511		
Skewness	-1.605		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.52	Shapiro Wilk Test Statistic	0.525
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.514	95% H-UCL	601.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.2
95% Adjusted-CLT UCL (Chen-1995)	9.089	97.5% Chebyshev (MVUE) UCL	158.4
95% Modified-t UCL (Johnson-1978)	9.46	99% Chebyshev (MVUE) UCL	233.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.612	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.99		
MLE of Mean	7.944		
MLE of Standard Deviation	10.16		
nu star	24.47		
Approximate Chi Square Value (.05)	14.2	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	9.438
Adjusted Chi Square Value	13.59	95% Jackknife UCL	9.514
		95% Standard Bootstrap UCL	9.405
Anderson-Darling Test Statistic	5.551	95% Bootstrap-t UCL	9.2
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	9.081
Kolmogorov-Smirnov Test Statistic	0.485	95% Percentile Bootstrap UCL	9.374
Kolmogorov-Smirnov 5% Critical Value	0.202	95% BCA Bootstrap UCL	9.006
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.9
		97.5% Chebyshev(Mean, Sd) UCL	13.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.98
95% Approximate Gamma UCL	13.68		
95% Adjusted Gamma UCL	14.3		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCl	13.62
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	75.64	Maximum of Log Data	4.326
Mean	59.87	Mean of log Data	3.985
Median	65	SD of log Data	0.614
SD	17.34		
Coefficient of Variation	0.29		
Skewness	-2.762		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.472	Shapiro Wilk Test Statistic	0.411
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.57	95% H-UCL	87.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.7
95% Adjusted-CLT UCL (Chen-1995)	63.68	97.5% Chebyshev (MVUE) UCL	122.2
95% Modified-t UCL (Johnson-1978)	66.17	99% Chebyshev (MVUE) UCL	156.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.129	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.5		
MLE of Mean	59.87		
MLE of Standard Deviation	29.46		
nu star	165.2		
Approximate Chi Square Value (.05)	136.4	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	66.24
Adjusted Chi Square Value	134.4	95% Jackknife UCL	66.57
		95% Standard Bootstrap UCL	66.07
Anderson-Darling Test Statistic	5.672	95% Bootstrap-t UCL	64.58
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	64.32
Kolmogorov-Smirnov Test Statistic	0.465	95% Percentile Bootstrap UCL	65.55
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	64.82
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.76
		97.5% Chebyshev(Mean, Sd) UCL	84.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	98.44
95% Approximate Gamma UCL	72.46		
95% Adjusted Gamma UCL	73.58		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	76.76
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.043	Minimum of Log Data	-3.147
Maximum	15.49	Maximum of Log Data	2.74
Mean	8.983	Mean of log Data	1.582
Median	10	SD of log Data	1.887
SD	4.054		
Coefficient of Variation	0.451		
Skewness	-1.567		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.653	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.55	95% H-UCL	170.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	76.71
95% Adjusted-CLT UCL (Chen-1995)	10.13	97.5% Chebyshev (MVUE) UCL	99.72
95% Modified-t UCL (Johnson-1978)	10.5	99% Chebyshev (MVUE) UCL	144.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.839	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.71		
MLE of Mean	8.983		
MLE of Standard Deviation	9.809		
nu star	33.54		
Approximate Chi Square Value (.05)	21.3	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	10.47
Adjusted Chi Square Value	20.53	95% Jackknife UCL	10.55
		95% Standard Bootstrap UCL	10.45
Anderson-Darling Test Statistic	5.349	95% Bootstrap-t UCL	10.26
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	10.17
Kolmogorov-Smirnov Test Statistic	0.514	95% Percentile Bootstrap UCL	10.35
Kolmogorov-Smirnov 5% Critical Value	0.2	95% BCA Bootstrap UCL	10.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.93
		97.5% Chebyshev(Mean, Sd) UCL	14.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18
95% Approximate Gamma UCL	14.15		
95% Adjusted Gamma UCL	14.68		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	20	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0083	Minimum of Log Data	-4.791
Maximum	0.778	Maximum of Log Data	-0.251
Mean	0.307	Mean of log Data	-1.426
Median	0.307	SD of log Data	1.009
SD	0.146		
Coefficient of Variation	0.474		
Skewness	1.054		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.364	95% H-UCL	0.738
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.811
95% Adjusted-CLT UCL (Chen-1995)	0.369	97.5% Chebyshev (MVUE) UCL	0.995
95% Modified-t UCL (Johnson-1978)	0.365	99% Chebyshev (MVUE) UCL	1.356
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.885	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.163		
MLE of Mean	0.307		
MLE of Standard Deviation	0.224		
nu star	75.4		
Approximate Chi Square Value (.05)	56.4	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	0.361
Adjusted Chi Square Value	55.1	95% Jackknife UCL	0.364
		95% Standard Bootstrap UCL	0.359
Anderson-Darling Test Statistic	4.766	95% Bootstrap-t UCL	0.367
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	0.416
Kolmogorov-Smirnov Test Statistic	0.49	95% Percentile Bootstrap UCL	0.361
Kolmogorov-Smirnov 5% Critical Value	0.196	95% BCA Bootstrap UCL	0.369
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.45
		97.5% Chebyshev(Mean, Sd) UCL	0.511
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.632
95% Approximate Gamma UCL	0.411		
95% Adjusted Gamma UCL	0.421		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.45

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.83	Minimum of Log Data	-0.186
Maximum	1.38	Maximum of Log Data	0.322
Mean	1.077	Mean of log Data	0.0706
Median	1.077	SD of log Data	0.0834
SD	0.0906		
Coefficient of Variation	0.0842		
Skewness	0.999		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.497	Shapiro Wilk Test Statistic	0.504
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.112	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.164
95% Adjusted-CLT UCL (Chen-1995)	1.115	97.5% Chebyshev (MVUE) UCL	1.202
95% Modified-t UCL (Johnson-1978)	1.112	99% Chebyshev (MVUE) UCL	1.277

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	128.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00836		
MLE of Mean	1.077		
MLE of Standard Deviation	0.0948		
nu star	5154		
Approximate Chi Square Value (.05)	4989	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	1.11
Adjusted Chi Square Value	4976	95% Jackknife UCL	1.112
		95% Standard Bootstrap UCL	1.109
Anderson-Darling Test Statistic	5.012	95% Bootstrap-t UCL	1.113
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1.146
Kolmogorov-Smirnov Test Statistic	0.439	95% Percentile Bootstrap UCL	1.113
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	1.11
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.165
		97.5% Chebyshev(Mean, Sd) UCL	1.203
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.278
95% Approximate Gamma UCL	1.112		
95% Adjusted Gamma UCL	1.115		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.112
	or 95% Modified-t UCL	1.112

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	17.5	Minimum of Log Data	2.862
Maximum	45.2	Maximum of Log Data	3.811
Mean	29.9	Mean of log Data	3.383
Median	29.9	SD of log Data	0.181
SD	5.176		
Coefficient of Variation	0.173		
Skewness	0.489		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.638	Shapiro Wilk Test Statistic	0.632
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	31.9	95% H-UCL	32.23
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	35.22
95% Adjusted-CLT UCL (Chen-1995)	31.94	97.5% Chebyshev (MVUE) UCL	37.51
95% Modified-t UCL (Johnson-1978)	31.92	99% Chebyshev (MVUE) UCL	42.01

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	28.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.038		
MLE of Mean	29.9		
MLE of Standard Deviation	5.571		
nu star	1152		
Approximate Chi Square Value (.05)	1074	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	31.8
Adjusted Chi Square Value	1068	95% Jackknife UCL	31.9
		95% Standard Bootstrap UCL	31.77
Anderson-Darling Test Statistic	3.946	95% Bootstrap-t UCL	31.99
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	33.03
Kolmogorov-Smirnov Test Statistic	0.423	95% Percentile Bootstrap UCL	31.74
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	31.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.95
		97.5% Chebyshev(Mean, Sd) UCL	37.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.42
95% Approximate Gamma UCL	32.07		
95% Adjusted Gamma UCL	32.24		

Potential UCL to Use		
	Use 95% Student's-t UCL	31.9
	or 95% Modified-t UCL	31.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-06.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	118.8	Minimum of Log Data	4.778
Maximum	2807	Maximum of Log Data	7.94
Mean	823.8	Mean of log Data	6.329
Median	823.8	SD of log Data	0.954
SD	767.4		
Coefficient of Variation	0.932		
Skewness	1.786		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1222	95% H-UCL	1996
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1915
95% Adjusted-CLT UCL (Chen-1995)	1310	97.5% Chebyshev (MVUE) UCL	2380
95% Modified-t UCL (Johnson-1978)	1241	99% Chebyshev (MVUE) UCL	3294

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.138	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	723.9		
MLE of Mean	823.8		
MLE of Standard Deviation	772.2		
nu star	27.31		
Approximate Chi Square Value (.05)	16.39	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1188
Adjusted Chi Square Value	15.11	95% Jackknife UCL	1222
		95% Standard Bootstrap UCL	1164
Anderson-Darling Test Statistic	0.445	95% Bootstrap-t UCL	1551
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	3236
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	1199
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	1320
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1789
		97.5% Chebyshev(Mean, Sd) UCL	2207
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3028
95% Approximate Gamma UCL	1372		
95% Adjusted Gamma UCL	1489		

Potential UCL to Use			
		Use 95% Approximate Gamma UCL	1372

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	12.1	Minimum of Log Data	2.493
Maximum	80.6	Maximum of Log Data	4.389
Mean	61.12	Mean of log Data	4.038
Median	63.06	SD of log Data	0.496
SD	16.82		
Coefficient of Variation	0.275		
Skewness	-2.429		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.67	Shapiro Wilk Test Statistic	0.498
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.83	95% H-UCL	88.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	103.9
95% Adjusted-CLT UCL (Chen-1995)	65.46	97.5% Chebyshev (MVUE) UCL	121.4
95% Modified-t UCL (Johnson-1978)	69.27	99% Chebyshev (MVUE) UCL	155.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.188	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.78		
MLE of Mean	61.12		
MLE of Standard Deviation	26.83		
nu star	124.5		
Approximate Chi Square Value (.05)	99.74	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.1
Adjusted Chi Square Value	96.36	95% Jackknife UCL	69.83
		95% Standard Bootstrap UCL	68.69
Anderson-Darling Test Statistic	2.388	95% Bootstrap-t UCL	67.52
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	66.66
Kolmogorov-Smirnov Test Statistic	0.429	95% Percentile Bootstrap UCL	67.61
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	66.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.28
		97.5% Chebyshev(Mean, Sd) UCL	91.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.4
95% Approximate Gamma UCL	76.29		
95% Adjusted Gamma UCL	78.97		

Potential UCL to Use		
	Use 95% Student's-t UCL	69.83
	or 95% Modified-t UCL	69.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.035	Minimum of Log Data	-3.352
Maximum	10	Maximum of Log Data	2.303
Mean	7.496	Mean of log Data	1.284
Median	8.693	SD of log Data	2.112
SD	3.671		
Coefficient of Variation	0.49		
Skewness	-1.624		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.682	Shapiro Wilk Test Statistic	0.518
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.4	95% H-UCL	924.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	84.57
95% Adjusted-CLT UCL (Chen-1995)	8.708	97.5% Chebyshev (MVUE) UCL	111.7
95% Modified-t UCL (Johnson-1978)	9.317	99% Chebyshev (MVUE) UCL	164.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.664	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.29		
MLE of Mean	7.496		
MLE of Standard Deviation	9.2		
nu star	15.93		
Approximate Chi Square Value (.05)	7.915	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.24
Adjusted Chi Square Value	7.069	95% Jackknife UCL	9.4
		95% Standard Bootstrap UCL	9.15
Anderson-Darling Test Statistic	2.932	95% Bootstrap-t UCL	8.878
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	8.791
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	9.147
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	8.938
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.12
		97.5% Chebyshev(Mean, Sd) UCL	14.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.04
95% Approximate Gamma UCL	15.09		
95% Adjusted Gamma UCL	16.9		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.04

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.8	Minimum of Log Data	-0.223
Maximum	1.32	Maximum of Log Data	0.278
Mean	1.06	Mean of log Data	0.0531
Median	1.06	SD of log Data	0.107
SD	0.111		
Coefficient of Variation	0.105		
Skewness	#######		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.592
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.117	95% H-UCL	1.124
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.204
95% Adjusted-CLT UCL (Chen-1995)	1.113	97.5% Chebyshev (MVUE) UCL	1.266
95% Modified-t UCL (Johnson-1978)	1.117	99% Chebyshev (MVUE) UCL	1.388

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	72.7	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0146			
MLE of Mean	1.06			
MLE of Standard Deviation	0.124			
nu star	1745			
Approximate Chi Square Value (.05)	1649	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		1.113
Adjusted Chi Square Value	1635	95% Jackknife UCL		1.117
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.723	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		1.2
		97.5% Chebyshev(Mean, Sd) UCL		1.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		1.378
95% Approximate Gamma UCL	1.122			
95% Adjusted Gamma UCL	1.132			

Potential UCL to Use		
	Use 95% Student's-t UCL	1.117
	or 95% Modified-t UCL	1.117

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-07.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	5.88	Minimum of Log Data	1.772
Maximum	11	Maximum of Log Data	2.398
Mean	9.37	Mean of log Data	2.22
Median	9.525	SD of log Data	0.197
SD	1.688		
Coefficient of Variation	0.18		
Skewness	-0.764		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.854
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.11	95% H-UCL	10.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.4
95% Adjusted-CLT UCL (Chen-1995)	9.978	97.5% Chebyshev (MVUE) UCL	12.28
95% Modified-t UCL (Johnson-1978)	10.1	99% Chebyshev (MVUE) UCL	14

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	23.92	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.392		
MLE of Mean	9.37		
MLE of Standard Deviation	1.916		
nu star	765.5		
Approximate Chi Square Value (.05)	702.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.06
Adjusted Chi Square Value	695.4	95% Jackknife UCL	10.11
		95% Standard Bootstrap UCL	10.03
Anderson-Darling Test Statistic	0.859	95% Bootstrap-t UCL	9.998
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	9.981
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	10.03
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	9.981
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.21
		97.5% Chebyshev(Mean, Sd) UCL	12.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.57
95% Approximate Gamma UCL	10.21		
95% Adjusted Gamma UCL	10.31		

Potential UCL to Use		Use 95% Approximate Gamma UCL	10.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	32.93	Minimum of Log Data	3.494
Maximum	85	Maximum of Log Data	4.443
Mean	49.43	Mean of log Data	3.845
Median	42.93	SD of log Data	0.33
SD	18.64		
Coefficient of Variation	0.377		
Skewness	1.362		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.6	95% H-UCL	58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	67.11
95% Adjusted-CLT UCL (Chen-1995)	58.79	97.5% Chebyshev (MVUE) UCL	74.86
95% Modified-t UCL (Johnson-1978)	57.87	99% Chebyshev (MVUE) UCL	90.09

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.471	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	6.616		
MLE of Mean	49.43		
MLE of Standard Deviation	18.08		
nu star	239.1		
Approximate Chi Square Value (.05)	204.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	57.1
Adjusted Chi Square Value	200.6	95% Jackknife UCL	57.6
		95% Standard Bootstrap UCL	56.92
Anderson-Darling Test Statistic	1.237	95% Bootstrap-t UCL	60.18
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	56.26
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	56.87
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	58.09
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	69.75
		97.5% Chebyshev(Mean, Sd) UCL	78.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	95.8
95% Approximate Gamma UCL	57.85		
95% Adjusted Gamma UCL	58.9		

Potential UCL to Use		Use 95% Approximate Gamma UCL	57.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	146.7	Minimum of Log Data	4.988
Maximum	1410	Maximum of Log Data	7.251
Mean	625.6	Mean of log Data	6.265
Median	563.6	SD of log Data	0.635
SD	365.1		
Coefficient of Variation	0.584		
Skewness	0.806		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	785.6	95% H-UCL	923.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1094
95% Adjusted-CLT UCL (Chen-1995)	795.4	97.5% Chebyshev (MVUE) UCL	1294
95% Modified-t UCL (Johnson-1978)	788.7	99% Chebyshev (MVUE) UCL	1685

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.512	Data appear Normal at 5% Significance Level	
Theta Star	249		
MLE of Mean	625.6		
MLE of Standard Deviation	394.7		
nu star	80.39		
Approximate Chi Square Value (.05)	60.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	775.7
Adjusted Chi Square Value	58.79	95% Jackknife UCL	785.6
		95% Standard Bootstrap UCL	771.4
Anderson-Darling Test Statistic	0.268	95% Bootstrap-t UCL	806
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	799.4
Kolmogorov-Smirnov Test Statistic	0.117	95% Percentile Bootstrap UCL	769.8
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	788.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1023
		97.5% Chebyshev(Mean, Sd) UCL	1196
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1534
95% Approximate Gamma UCL	828.1		
95% Adjusted Gamma UCL	855.5		

Potential UCL to Use	Use 95% Student's-t UCL	785.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	77.14	Maximum of Log Data	4.346
Mean	56.78	Mean of log Data	3.88
Median	65	SD of log Data	0.753
SD	19.94		
Coefficient of Variation	0.351		
Skewness	-2.222		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.597	Shapiro Wilk Test Statistic	0.487
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.51	95% H-UCL	101.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	117.9
95% Adjusted-CLT UCL (Chen-1995)	62.02	97.5% Chebyshev (MVUE) UCL	141.7
95% Modified-t UCL (Johnson-1978)	65.05	99% Chebyshev (MVUE) UCL	188.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.721	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.86		
MLE of Mean	56.78		
MLE of Standard Deviation	34.42		
nu star	87.08		
Approximate Chi Square Value (.05)	66.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	64.97
Adjusted Chi Square Value	64.53	95% Jackknife UCL	65.51
		95% Standard Bootstrap UCL	64.57
Anderson-Darling Test Statistic	3.852	95% Bootstrap-t UCL	63.57
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	62.94
Kolmogorov-Smirnov Test Statistic	0.448	95% Percentile Bootstrap UCL	64.22
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	62.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.5
		97.5% Chebyshev(Mean, Sd) UCL	87.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.4
95% Approximate Gamma UCL	74.27		
95% Adjusted Gamma UCL	76.62		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	78.5
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	13.53	Maximum of Log Data	2.605
Mean	9.564	Mean of log Data	1.963
Median	10	SD of log Data	1.427
SD	2.698		
Coefficient of Variation	0.282		
Skewness	-3.109		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.473	Shapiro Wilk Test Statistic	0.307
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.75	95% H-UCL	69.37
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.13
95% Adjusted-CLT UCL (Chen-1995)	10.11	97.5% Chebyshev (MVUE) UCL	62.76
95% Modified-t UCL (Johnson-1978)	10.66	99% Chebyshev (MVUE) UCL	89.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.539	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.216		
MLE of Mean	9.564		
MLE of Standard Deviation	7.71		
nu star	49.23		
Approximate Chi Square Value (.05)	34.13	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.67
Adjusted Chi Square Value	32.7	95% Jackknife UCL	10.75
		95% Standard Bootstrap UCL	10.61
Anderson-Darling Test Statistic	5.236	95% Bootstrap-t UCL	10.35
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	10.25
Kolmogorov-Smirnov Test Statistic	0.535	95% Percentile Bootstrap UCL	10.43
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	10.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.5
		97.5% Chebyshev(Mean, Sd) UCL	13.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.28
95% Approximate Gamma UCL	13.8		
95% Adjusted Gamma UCL	14.4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-08.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.46	Minimum of Log Data	-0.777
Maximum	0.62	Maximum of Log Data	-0.478
Mean	0.54	Mean of log Data	-0.618
Median	0.54	SD of log Data	0.0638
SD	0.0341		
Coefficient of Variation	0.0632		
Skewness	#######		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.558	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.583
95% Adjusted-CLT UCL (Chen-1995)	0.556	97.5% Chebyshev (MVUE) UCL	0.602
95% Modified-t UCL (Johnson-1978)	0.558	99% Chebyshev (MVUE) UCL	0.639

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	203	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00266		
MLE of Mean	0.54		
MLE of Standard Deviation	0.0379		
nu star	4871		
Approximate Chi Square Value (.05)	4710	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.556
Adjusted Chi Square Value	4685	95% Jackknife UCL	0.558
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.717	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.425	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.583
		97.5% Chebyshev(Mean, Sd) UCL	0.601
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.638
95% Approximate Gamma UCL	0.558		
95% Adjusted Gamma UCL	0.561		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.558
	or 95% Modified-t UCL	0.558

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6.43	Minimum of Log Data	1.861
Maximum	14.03	Maximum of Log Data	2.641
Mean	9.793	Mean of log Data	2.26
Median	9.793	SD of log Data	0.22
SD	2.077		
Coefficient of Variation	0.212		
Skewness	0.135		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.934	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.87	95% H-UCL	11.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.53
95% Adjusted-CLT UCL (Chen-1995)	10.8	97.5% Chebyshev (MVUE) UCL	13.71
95% Modified-t UCL (Johnson-1978)	10.87	99% Chebyshev (MVUE) UCL	16.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.58	Data appear Normal at 5% Significance Level	
Theta Star	0.557		
MLE of Mean	9.793		
MLE of Standard Deviation	2.336		
nu star	422		
Approximate Chi Square Value (.05)	375.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.78
Adjusted Chi Square Value	368.6	95% Jackknife UCL	10.87
		95% Standard Bootstrap UCL	10.74
Anderson-Darling Test Statistic	0.474	95% Bootstrap-t UCL	10.88
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	10.97
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	10.73
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.74
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.41
		97.5% Chebyshev(Mean, Sd) UCL	13.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.76
95% Approximate Gamma UCL	11.01		
95% Adjusted Gamma UCL	11.21		

Potential UCL to Use		Use 95% Student's-t UCL	10.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.007	Minimum of Log Data	-4.962
Maximum	0.36	Maximum of Log Data	-1.022
Mean	0.184	Mean of log Data	-1.912
Median	0.184	SD of log Data	0.98
SD	0.0753		
Coefficient of Variation	0.41		
Skewness	2.22E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.441
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.223	95% H-UCL	0.559
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.525
95% Adjusted-CLT UCL (Chen-1995)	0.219	97.5% Chebyshev (MVUE) UCL	0.654
95% Modified-t UCL (Johnson-1978)	0.223	99% Chebyshev (MVUE) UCL	0.907

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.907	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0962		
MLE of Mean	0.184		
MLE of Standard Deviation	0.133		
nu star	45.76		
Approximate Chi Square Value (.05)	31.24	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.219
Adjusted Chi Square Value	29.42	95% Jackknife UCL	0.223
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.116	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.501	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.278
		97.5% Chebyshev(Mean, Sd) UCL	0.319
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.4
95% Approximate Gamma UCL	0.269		
95% Adjusted Gamma UCL	0.285		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.278

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	11	Minimum of Log Data	2.398
Maximum	85	Maximum of Log Data	4.443
Mean	45.58	Mean of log Data	3.696
Median	46.18	SD of log Data	0.591
SD	19.31		
Coefficient of Variation	0.424		
Skewness	-0.14		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Test Statistic	0.739
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	55.59	95% H-UCL	71.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	83.35
95% Adjusted-CLT UCL (Chen-1995)	54.51	97.5% Chebyshev (MVUE) UCL	99.01
95% Modified-t UCL (Johnson-1978)	55.55	99% Chebyshev (MVUE) UCL	129.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.201	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.24		
MLE of Mean	45.58		
MLE of Standard Deviation	25.47		
nu star	76.83		
Approximate Chi Square Value (.05)	57.64	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	54.75
Adjusted Chi Square Value	55.11	95% Jackknife UCL	55.59
		95% Standard Bootstrap UCL	54.37
Anderson-Darling Test Statistic	1.386	95% Bootstrap-t UCL	55.05
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	56.06
Kolmogorov-Smirnov Test Statistic	0.364	95% Percentile Bootstrap UCL	54.05
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	54.25
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	69.88
		97.5% Chebyshev(Mean, Sd) UCL	80.39
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	101
95% Approximate Gamma UCL	60.75		
95% Adjusted Gamma UCL	63.54		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	69.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	4.8	Minimum of Log Data	1.569
Maximum	18.7	Maximum of Log Data	2.929
Mean	11.75	Mean of log Data	2.428
Median	11.75	SD of log Data	0.302
SD	2.963		
Coefficient of Variation	0.252		
Skewness	#######		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.553
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.29	95% H-UCL	14.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.35
95% Adjusted-CLT UCL (Chen-1995)	13.16	97.5% Chebyshev (MVUE) UCL	18.31
95% Modified-t UCL (Johnson-1978)	13.29	99% Chebyshev (MVUE) UCL	22.16

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.63	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.105		
MLE of Mean	11.75		
MLE of Standard Deviation	3.604		
nu star	255.1		
Approximate Chi Square Value (.05)	219.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	13.16
Adjusted Chi Square Value	214.1	95% Jackknife UCL	13.29
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.781	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.48
		97.5% Chebyshev(Mean, Sd) UCL	17.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.26
95% Approximate Gamma UCL	13.68		
95% Adjusted Gamma UCL	14		

Potential UCL to Use		
	Use 95% Student's-t UCL	13.29
	or 95% Modified-t UCL	13.29

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	233.8	Minimum of Log Data	5.455
Maximum	2810	Maximum of Log Data	7.941
Mean	899.9	Mean of log Data	6.575
Median	644.8	SD of log Data	0.676
SD	726.3		
Coefficient of Variation	0.807		
Skewness	2.019		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.754	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1276	95% H-UCL	1463
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1660
95% Adjusted-CLT UCL (Chen-1995)	1375	97.5% Chebyshev (MVUE) UCL	1997
95% Modified-t UCL (Johnson-1978)	1297	99% Chebyshev (MVUE) UCL	2660

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.821	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	494.1		
MLE of Mean	899.9		
MLE of Standard Deviation	666.8		
nu star	43.71		
Approximate Chi Square Value (.05)	29.55	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1245
Adjusted Chi Square Value	27.79	95% Jackknife UCL	1276
		95% Standard Bootstrap UCL	1229
Anderson-Darling Test Statistic	0.542	95% Bootstrap-t UCL	1890
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	3223
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	1257
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	1370
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1814
		97.5% Chebyshev(Mean, Sd) UCL	2209
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2986
95% Approximate Gamma UCL	1331		
95% Adjusted Gamma UCL	1416		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1331

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	7	Minimum of Log Data	1.946
Maximum	65	Maximum of Log Data	4.174
Mean	52.19	Mean of log Data	3.79
Median	62.54	SD of log Data	0.741
SD	20.57		
Coefficient of Variation	0.394		
Skewness	-1.768		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.663	Shapiro Wilk Test Statistic	0.582
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	62.85	95% H-UCL	101.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	112
95% Adjusted-CLT UCL (Chen-1995)	58.71	97.5% Chebyshev (MVUE) UCL	135.9
95% Modified-t UCL (Johnson-1978)	62.35	99% Chebyshev (MVUE) UCL	182.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.455	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.25		
MLE of Mean	52.19		
MLE of Standard Deviation	33.3		
nu star	58.93		
Approximate Chi Square Value (.05)	42.28	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	61.95
Adjusted Chi Square Value	40.14	95% Jackknife UCL	62.85
		95% Standard Bootstrap UCL	61.4
Anderson-Darling Test Statistic	2.296	95% Bootstrap-t UCL	60.2
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	59.13
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	61.39
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	59.66
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.07
		97.5% Chebyshev(Mean, Sd) UCL	89.28
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111.3
95% Approximate Gamma UCL	72.74		
95% Adjusted Gamma UCL	76.62		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	78.07

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.008	Minimum of Log Data	-4.828
Maximum	0.485	Maximum of Log Data	-0.724
Mean	0.247	Mean of log Data	-1.63
Median	0.247	SD of log Data	1.026
SD	0.102		
Coefficient of Variation	0.413		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.436
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.299	95% H-UCL	0.829
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.744
95% Adjusted-CLT UCL (Chen-1995)	0.295	97.5% Chebyshev (MVUE) UCL	0.931
95% Modified-t UCL (Johnson-1978)	0.299	99% Chebyshev (MVUE) UCL	1.299

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.806	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.136		
MLE of Mean	0.247		
MLE of Standard Deviation	0.183		
nu star	43.34		
Approximate Chi Square Value (.05)	29.25	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.295
Adjusted Chi Square Value	27.49	95% Jackknife UCL	0.299
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.14	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.504	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.374
		97.5% Chebyshev(Mean, Sd) UCL	0.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.539
95% Approximate Gamma UCL	0.365		
95% Adjusted Gamma UCL	0.389		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.374

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.85	Minimum of Log Data	-0.163
Maximum	1.39	Maximum of Log Data	0.329
Mean	1.12	Mean of log Data	0.108
Median	1.12	SD of log Data	0.106
SD	0.115		
Coefficient of Variation	0.103		
Skewness	1.74E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.592
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.18	95% H-UCL	1.186
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.269
95% Adjusted-CLT UCL (Chen-1995)	1.175	97.5% Chebyshev (MVUE) UCL	1.333
95% Modified-t UCL (Johnson-1978)	1.18	99% Chebyshev (MVUE) UCL	1.46

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	75.34	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0149		
MLE of Mean	1.12		
MLE of Standard Deviation	0.129		
nu star	1808		
Approximate Chi Square Value (.05)	1710	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.175
Adjusted Chi Square Value	1696	95% Jackknife UCL	1.18
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.723	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.265
		97.5% Chebyshev(Mean, Sd) UCL	1.328
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.451
95% Approximate Gamma UCL	1.184		
95% Adjusted Gamma UCL	1.194		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.18
	or 95% Modified-t UCL	1.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-09.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.2	Minimum of Log Data	1.649
Maximum	14	Maximum of Log Data	2.639
Mean	8.442	Mean of log Data	2.088
Median	8.442	SD of log Data	0.309
SD	2.693		
Coefficient of Variation	0.319		
Skewness	0.732		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.773	95% H-UCL	10.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.62
95% Adjusted-CLT UCL (Chen-1995)	9.833	97.5% Chebyshev (MVUE) UCL	13
95% Modified-t UCL (Johnson-1978)	9.799	99% Chebyshev (MVUE) UCL	15.71

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.735	Data appear Normal at 5% Significance Level	
Theta Star	0.966		
MLE of Mean	8.442		
MLE of Standard Deviation	2.856		
nu star	227.1		
Approximate Chi Square Value (.05)	193.2	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	9.671
Adjusted Chi Square Value	188.8	95% Jackknife UCL	9.773
		95% Standard Bootstrap UCL	9.584
Anderson-Darling Test Statistic	0.401	95% Bootstrap-t UCL	10
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	9.873
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	9.6
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	9.72
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.7
		97.5% Chebyshev(Mean, Sd) UCL	13.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.87
95% Approximate Gamma UCL	9.922		
95% Adjusted Gamma UCL	10.16		

Potential UCL to Use			
		Use 95% Student's-t UCL	9.773

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	32.84	Minimum of Log Data	3.492
Maximum	51.65	Maximum of Log Data	3.944
Mean	42.04	Mean of log Data	3.73
Median	42.04	SD of log Data	0.134
SD	5.546		
Coefficient of Variation	0.132		
Skewness	0.024		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.941	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	44.78	95% H-UCL	45.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.87
95% Adjusted-CLT UCL (Chen-1995)	44.58	97.5% Chebyshev (MVUE) UCL	51.82
95% Modified-t UCL (Johnson-1978)	44.78	99% Chebyshev (MVUE) UCL	57.62

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	47.16	Data appear Normal at 5% Significance Level	
Theta Star	0.891		
MLE of Mean	42.04		
MLE of Standard Deviation	6.122		
nu star	1226		
Approximate Chi Square Value (.05)	1146	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	44.57
Adjusted Chi Square Value	1135	95% Jackknife UCL	44.78
		95% Standard Bootstrap UCL	44.56
Anderson-Darling Test Statistic	0.421	95% Bootstrap-t UCL	44.88
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	44.98
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	44.41
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	44.51
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48.74
		97.5% Chebyshev(Mean, Sd) UCL	51.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	57.34
95% Approximate Gamma UCL	44.99		
95% Adjusted Gamma UCL	45.42		

Potential UCL to Use		Use 95% Student's-t UCL	44.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	129.4	Minimum of Log Data	4.863
Maximum	1080	Maximum of Log Data	6.985
Mean	427.5	Mean of log Data	5.905
Median	427.5	SD of log Data	0.58
SD	256.1		
Coefficient of Variation	0.599		
Skewness	1.458		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.976
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	554.1	95% H-UCL	628.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	737.9
95% Adjusted-CLT UCL (Chen-1995)	575	97.5% Chebyshev (MVUE) UCL	872.1
95% Modified-t UCL (Johnson-1978)	558.9	99% Chebyshev (MVUE) UCL	1136

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.681	Data appear Normal at 5% Significance Level	
Theta Star	159.5		
MLE of Mean	427.5		
MLE of Standard Deviation	261.1		
nu star	69.71		
Approximate Chi Square Value (.05)	51.49	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	544.3
Adjusted Chi Square Value	49.26	95% Jackknife UCL	554.1
		95% Standard Bootstrap UCL	543.6
Anderson-Darling Test Statistic	0.264	95% Bootstrap-t UCL	610
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	1202
Kolmogorov-Smirnov Test Statistic	0.121	95% Percentile Bootstrap UCL	543.1
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	578
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	737.1
		97.5% Chebyshev(Mean, Sd) UCL	871.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1134
95% Approximate Gamma UCL	578.8		
95% Adjusted Gamma UCL	605		

Potential UCL to Use		Use 95% Student's-t UCL	554.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	9.2	Minimum of Log Data	2.219
Maximum	65	Maximum of Log Data	4.174
Mean	58.9	Mean of log Data	3.995
Median	65	SD of log Data	0.535
SD	15.19		
Coefficient of Variation	0.258		
Skewness	-3.4		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.443	Shapiro Wilk Test Statistic	0.371
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.41	95% H-UCL	87.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	103.2
95% Adjusted-CLT UCL (Chen-1995)	61.59	97.5% Chebyshev (MVUE) UCL	121
95% Modified-t UCL (Johnson-1978)	65.75	99% Chebyshev (MVUE) UCL	156.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.924	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.96		
MLE of Mean	58.9		
MLE of Standard Deviation	26.54		
nu star	128		
Approximate Chi Square Value (.05)	102.9	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	65.83
Adjusted Chi Square Value	99.68	95% Jackknife UCL	66.41
		95% Standard Bootstrap UCL	65.5
Anderson-Darling Test Statistic	3.642	95% Bootstrap-t UCL	64.07
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	63.14
Kolmogorov-Smirnov Test Statistic	0.476	95% Percentile Bootstrap UCL	63.73
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	63.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.27
		97.5% Chebyshev(Mean, Sd) UCL	85.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	100.8
95% Approximate Gamma UCL	73.29		
95% Adjusted Gamma UCL	75.65		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	77.27
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.031	Minimum of Log Data	-3.474
Maximum	10.73	Maximum of Log Data	2.373
Mean	8.079	Mean of log Data	1.375
Median	10	SD of log Data	2.14
SD	3.678		
Coefficient of Variation	0.455		
Skewness	-1.93		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.622	Shapiro Wilk Test Statistic	0.481
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.898	95% H-UCL	921.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.94
95% Adjusted-CLT UCL (Chen-1995)	9.175	97.5% Chebyshev (MVUE) UCL	130.6
95% Modified-t UCL (Johnson-1978)	9.807	99% Chebyshev (MVUE) UCL	192.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.688	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.75		
MLE of Mean	8.079		
MLE of Standard Deviation	9.744		
nu star	17.88		
Approximate Chi Square Value (.05)	9.302	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	9.757
Adjusted Chi Square Value	8.433	95% Jackknife UCL	9.898
		95% Standard Bootstrap UCL	9.677
Anderson-Darling Test Statistic	3.556	95% Bootstrap-t UCL	9.514
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	9.304
Kolmogorov-Smirnov Test Statistic	0.491	95% Percentile Bootstrap UCL	9.557
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	9.374
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.53
		97.5% Chebyshev(Mean, Sd) UCL	14.45
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.23
95% Approximate Gamma UCL	15.53		
95% Adjusted Gamma UCL	17.13		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.23

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-10.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	5.33	Minimum of Log Data	1.673
Maximum	14.08	Maximum of Log Data	2.645
Mean	9.595	Mean of log Data	2.221
Median	9.595	SD of log Data	0.303
SD	2.749		
Coefficient of Variation	0.286		
Skewness	0.16		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.02	95% H-UCL	11.51
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.32
95% Adjusted-CLT UCL (Chen-1995)	10.94	97.5% Chebyshev (MVUE) UCL	14.92
95% Modified-t UCL (Johnson-1978)	11.03	99% Chebyshev (MVUE) UCL	18.07

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.486	Data appear Normal at 5% Significance Level	
Theta Star	1.011		
MLE of Mean	9.595		
MLE of Standard Deviation	3.115		
nu star	227.7		
Approximate Chi Square Value (.05)	193.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.9
Adjusted Chi Square Value	189	95% Jackknife UCL	11.02
		95% Standard Bootstrap UCL	10.82
Anderson-Darling Test Statistic	0.405	95% Bootstrap-t UCL	11.05
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.12
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	10.89
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.79
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.05
		97.5% Chebyshev(Mean, Sd) UCL	14.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.49
95% Approximate Gamma UCL	11.28		
95% Adjusted Gamma UCL	11.56		

Potential UCL to Use		Use 95% Student's-t UCL	11.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cesium-137 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	33.82	Minimum of Log Data	3.521
Maximum	85	Maximum of Log Data	4.443
Mean	52.41	Mean of log Data	3.918
Median	51.18	SD of log Data	0.292
SD	16.69		
Coefficient of Variation	0.318		
Skewness	1.273		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.804	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	61.07	95% H-UCL	62.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.66
95% Adjusted-CLT UCL (Chen-1995)	62.23	97.5% Chebyshev (MVUE) UCL	80.04
95% Modified-t UCL (Johnson-1978)	61.36	99% Chebyshev (MVUE) UCL	96.49

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.301	Data appear Lognormal at 5% Significance Level	
Theta Star	5.635		
MLE of Mean	52.41		
MLE of Standard Deviation	17.19		
nu star	223.2		
Approximate Chi Square Value (.05)	189.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	60.34
Adjusted Chi Square Value	184.9	95% Jackknife UCL	61.07
		95% Standard Bootstrap UCL	59.99
Anderson-Darling Test Statistic	0.789	95% Bootstrap-t UCL	67.86
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	119.8
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	60.29
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	62.49
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.42
		97.5% Chebyshev(Mean, Sd) UCL	82.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	100.4
95% Approximate Gamma UCL	61.7		
95% Adjusted Gamma UCL	63.27		

Potential UCL to Use		
	Use 95% Student's-t UCL	61.07
	or 95% Modified-t UCL	61.36
	or 95% H-UCL	62.14

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.039	Minimum of Log Data	-3.257
Maximum	10	Maximum of Log Data	2.303
Mean	8.514	Mean of log Data	1.768
Median	9.257	SD of log Data	1.585
SD	2.784		
Coefficient of Variation	0.327		
Skewness	-2.98		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.552	Shapiro Wilk Test Statistic	0.37
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.957	95% H-UCL	143.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54.17
95% Adjusted-CLT UCL (Chen-1995)	9.098	97.5% Chebyshev (MVUE) UCL	70.26
95% Modified-t UCL (Johnson-1978)	9.842	99% Chebyshev (MVUE) UCL	101.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.167	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.295		
MLE of Mean	8.514		
MLE of Standard Deviation	7.881		
nu star	28.01		
Approximate Chi Square Value (.05)	16.93	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.836
Adjusted Chi Square Value	15.63	95% Jackknife UCL	9.957
		95% Standard Bootstrap UCL	9.766
Anderson-Darling Test Statistic	3.524	95% Bootstrap-t UCL	9.494
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	9.398
Kolmogorov-Smirnov Test Statistic	0.501	95% Percentile Bootstrap UCL	9.505
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	9.307
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.02
		97.5% Chebyshev(Mean, Sd) UCL	13.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.51
95% Approximate Gamma UCL	14.08		
95% Adjusted Gamma UCL	15.25		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) U(	16.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	9.4	Minimum of Log Data	2.241
Maximum	75.99	Maximum of Log Data	4.331
Mean	59.88	Mean of log Data	4.003
Median	65	SD of log Data	0.559
SD	16.56		
Coefficient of Variation	0.277		
Skewness	-2.96		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.581	Shapiro Wilk Test Statistic	0.439
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.46	95% H-UCL	93.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	108.9
95% Adjusted-CLT UCL (Chen-1995)	63.38	97.5% Chebyshev (MVUE) UCL	128.7
95% Modified-t UCL (Johnson-1978)	67.78	99% Chebyshev (MVUE) UCL	167.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.396	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.62		
MLE of Mean	59.88		
MLE of Standard Deviation	28.56		
nu star	105.5		
Approximate Chi Square Value (.05)	82.81	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	67.74
Adjusted Chi Square Value	79.74	95% Jackknife UCL	68.46
		95% Standard Bootstrap UCL	67.43
Anderson-Darling Test Statistic	2.865	95% Bootstrap-t UCL	65.87
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	64.82
Kolmogorov-Smirnov Test Statistic	0.472	95% Percentile Bootstrap UCL	65.86
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	64.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.71
		97.5% Chebyshev(Mean, Sd) UCL	89.73
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	107.4
95% Approximate Gamma UCL	76.3		
95% Adjusted Gamma UCL	79.23		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) U(	80.71
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-11.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6.09	Minimum of Log Data	1.807
Maximum	12.46	Maximum of Log Data	2.523
Mean	9.759	Mean of log Data	2.258
Median	10.65	SD of log Data	0.218
SD	1.935		
Coefficient of Variation	0.198		
Skewness	-0.75		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.856
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.76	95% H-UCL	11.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.47
95% Adjusted-CLT UCL (Chen-1995)	10.55	97.5% Chebyshev (MVUE) UCL	13.63
95% Modified-t UCL (Johnson-1978)	10.74	99% Chebyshev (MVUE) UCL	15.93

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.53	Data appear Normal at 5% Significance Level	
Theta Star	0.527		
MLE of Mean	9.759		
MLE of Standard Deviation	2.267		
nu star	444.7		
Approximate Chi Square Value (.05)	396.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.68
Adjusted Chi Square Value	389.9	95% Jackknife UCL	10.76
		95% Standard Bootstrap UCL	10.63
Anderson-Darling Test Statistic	0.84	95% Bootstrap-t UCL	10.63
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	10.51
Kolmogorov-Smirnov Test Statistic	0.249	95% Percentile Bootstrap UCL	10.63
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.55
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.19
		97.5% Chebyshev(Mean, Sd) UCL	13.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.32
95% Approximate Gamma UCL	10.94		
95% Adjusted Gamma UCL	11.13		

Potential UCL to Use		Use 95% Student's-t UCL	10.76

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	16.7	Minimum of Log Data	2.815
Maximum	85	Maximum of Log Data	4.443
Mean	62.22	Mean of log Data	4.022
Median	70.78	SD of log Data	0.532
SD	25.82		
Coefficient of Variation	0.415		
Skewness	-0.5		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.803
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	75.6	95% H-UCL	91.19
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	107
95% Adjusted-CLT UCL (Chen-1995)	73.33	97.5% Chebyshev (MVUE) UCL	125.9
95% Modified-t UCL (Johnson-1978)	75.42	99% Chebyshev (MVUE) UCL	162.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.634	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.12		
MLE of Mean	62.22		
MLE of Standard Deviation	32.64		
nu star	87.22		
Approximate Chi Square Value (.05)	66.69	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	74.48
Adjusted Chi Square Value	63.96	95% Jackknife UCL	75.6
		95% Standard Bootstrap UCL	73.9
Anderson-Darling Test Statistic	1.014	95% Bootstrap-t UCL	75.04
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	73.04
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	73.84
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	72.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.71
		97.5% Chebyshev(Mean, Sd) UCL	108.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	136.4
95% Approximate Gamma UCL	81.37		
95% Adjusted Gamma UCL	84.85		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	94.71
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	6.57	Minimum of Log Data	1.883
Maximum	10	Maximum of Log Data	2.303
Mean	9.555	Mean of log Data	2.25
Median	10	SD of log Data	0.131
SD	1.089		
Coefficient of Variation	0.114		
Skewness	-2.44		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.484	Shapiro Wilk Test Statistic	0.48
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.12	95% H-UCL	10.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.14
95% Adjusted-CLT UCL (Chen-1995)	9.835	97.5% Chebyshev (MVUE) UCL	11.82
95% Modified-t UCL (Johnson-1978)	10.08	99% Chebyshev (MVUE) UCL	13.16

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	52.64	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.182			
MLE of Mean	9.555			
MLE of Standard Deviation	1.317			
nu star	1263			
Approximate Chi Square Value (.05)	1182	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		10.07
Adjusted Chi Square Value	1170	95% Jackknife UCL		10.12
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.161	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.497	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		10.92
		97.5% Chebyshev(Mean, Sd) UCL		11.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		12.68
95% Approximate Gamma UCL	10.21			
95% Adjusted Gamma UCL	10.32			

Potential UCL to Use		
	Use 95% Student's-t UCL	10.12
	or 95% Modified-t UCL	10.08

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	9.9	Minimum of Log Data	2.293
Maximum	100.7	Maximum of Log Data	4.612
Mean	72.99	Mean of log Data	4.18
Median	73.53	SD of log Data	0.618
SD	24.09		
Coefficient of Variation	0.33		
Skewness	-1.56		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.827	Shapiro Wilk Test Statistic	0.58
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	85.48	95% H-UCL	121.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	140.1
95% Adjusted-CLT UCL (Chen-1995)	81.09	97.5% Chebyshev (MVUE) UCL	167.1
95% Modified-t UCL (Johnson-1978)	84.96	99% Chebyshev (MVUE) UCL	220.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.573	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.43		
MLE of Mean	72.99		
MLE of Standard Deviation	38.61		
nu star	85.76		
Approximate Chi Square Value (.05)	65.41	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	84.43
Adjusted Chi Square Value	62.71	95% Jackknife UCL	85.48
		95% Standard Bootstrap UCL	83.78
Anderson-Darling Test Statistic	1.556	95% Bootstrap-t UCL	83.25
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	82.34
Kolmogorov-Smirnov Test Statistic	0.381	95% Percentile Bootstrap UCL	83.56
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	81.37
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	103.3
		97.5% Chebyshev(Mean, Sd) UCL	116.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	142.2
95% Approximate Gamma UCL	95.7		
95% Adjusted Gamma UCL	99.83		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	103.3
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	0.084	Minimum of Log Data	-2.477
Maximum	5	Maximum of Log Data	1.609
Mean	4.59	Mean of log Data	1.269
Median	5	SD of log Data	1.18
SD	1.419		
Coefficient of Variation	0.309		
Skewness	-3.46		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.326	95% H-UCL	22.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.06
95% Adjusted-CLT UCL (Chen-1995)	4.826	97.5% Chebyshev (MVUE) UCL	21.61
95% Modified-t UCL (Johnson-1978)	5.258	99% Chebyshev (MVUE) UCL	30.55

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.64	Data do not follow a Discernable Distribution (0.05)		
Theta Star	2.8			
MLE of Mean	4.59			
MLE of Standard Deviation	3.585			
nu star	39.35			
Approximate Chi Square Value (.05)	25.98	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		5.264
Adjusted Chi Square Value	24.33	95% Jackknife UCL	N/A	
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.253	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.556	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		6.376
		97.5% Chebyshev(Mean, Sd) UCL		7.149
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		8.666
95% Approximate Gamma UCL	6.953			
95% Adjusted Gamma UCL	7.424			

Potential UCL to Use		
Recommended UCL exceeds the maximum observation	Use 95% Chebyshev (Mean, Sd) UCL	6.376

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.065	Minimum of Log Data	-2.733
Maximum	13.29	Maximum of Log Data	2.587
Mean	9.524	Mean of log Data	1.914
Median	10	SD of log Data	1.466
SD	3.129		
Coefficient of Variation	0.329		
Skewness	-2.81		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.529	Shapiro Wilk Test Statistic	0.366
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.15	95% H-UCL	107.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.42
95% Adjusted-CLT UCL (Chen-1995)	10.23	97.5% Chebyshev (MVUE) UCL	66.3
95% Modified-t UCL (Johnson-1978)	11.02	99% Chebyshev (MVUE) UCL	95.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.269	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.504		
MLE of Mean	9.524		
MLE of Standard Deviation	8.454		
nu star	30.46		
Approximate Chi Square Value (.05)	18.86	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.01
Adjusted Chi Square Value	17.47	95% Jackknife UCL	11.15
		95% Standard Bootstrap UCL	11
Anderson-Darling Test Statistic	3.74	95% Bootstrap-t UCL	10.72
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	10.42
Kolmogorov-Smirnov Test Statistic	0.545	95% Percentile Bootstrap UCL	10.7
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	10.55
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.46
		97.5% Chebyshev(Mean, Sd) UCL	15.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.51
95% Approximate Gamma UCL	15.39		
95% Adjusted Gamma UCL	16.6		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	13.46
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-12.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	5.8	Minimum of Log Data	1.758
Maximum	11	Maximum of Log Data	2.398
Mean	9.103	Mean of log Data	2.18
Median	10.09	SD of log Data	0.258
SD	2.17		
Coefficient of Variation	0.238		
Skewness	-0.484		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.789	Shapiro Wilk Test Statistic	0.793
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.23	95% H-UCL	10.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.1
95% Adjusted-CLT UCL (Chen-1995)	10.04	97.5% Chebyshev (MVUE) UCL	13.39
95% Modified-t UCL (Johnson-1978)	10.21	99% Chebyshev (MVUE) UCL	15.93

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.11	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.694		
MLE of Mean	9.103		
MLE of Standard Deviation	2.514		
nu star	314.6		
Approximate Chi Square Value (.05)	274.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.13
Adjusted Chi Square Value	268.8	95% Jackknife UCL	10.23
		95% Standard Bootstrap UCL	10.1
Anderson-Darling Test Statistic	1.135	95% Bootstrap-t UCL	10.14
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	9.949
Kolmogorov-Smirnov Test Statistic	0.314	95% Percentile Bootstrap UCL	10.08
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.07
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.83
		97.5% Chebyshev(Mean, Sd) UCL	13.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.34
95% Approximate Gamma UCL	10.43		
95% Adjusted Gamma UCL	10.65		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.23
	or 95% Modified-t UCL	10.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	13.5	Minimum of Log Data	2.603
Maximum	85	Maximum of Log Data	4.443
Mean	56.9	Mean of log Data	3.936
Median	50.67	SD of log Data	0.527
SD	23.69		
Coefficient of Variation	0.416		
Skewness	-0.08		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.18	95% H-UCL	83.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.65
95% Adjusted-CLT UCL (Chen-1995)	67.98	97.5% Chebyshev (MVUE) UCL	114.8
95% Modified-t UCL (Johnson-1978)	69.16	99% Chebyshev (MVUE) UCL	148.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.75	Data appear Normal at 5% Significance Level	
Theta Star	15.17		
MLE of Mean	56.9		
MLE of Standard Deviation	29.38		
nu star	90		
Approximate Chi Square Value (.05)	69.13	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	68.15
Adjusted Chi Square Value	66.34	95% Jackknife UCL	69.18
		95% Standard Bootstrap UCL	67.68
Anderson-Darling Test Statistic	0.611	95% Bootstrap-t UCL	69.12
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	67.63
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	67.35
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	67.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.71
		97.5% Chebyshev(Mean, Sd) UCL	99.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124.9
95% Approximate Gamma UCL	74.09		
95% Adjusted Gamma UCL	77.2		

Potential UCL to Use		Use 95% Student's-t UCL	69.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	252.2	Minimum of Log Data	5.53
Maximum	1488	Maximum of Log Data	7.305
Mean	542.8	Mean of log Data	6.165
Median	455.2	SD of log Data	0.502
SD	342.3		
Coefficient of Variation	0.631		
Skewness	2.176		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.753	Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	720.3	95% H-UCL	746.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	878.6
95% Adjusted-CLT UCL (Chen-1995)	771.6	97.5% Chebyshev (MVUE) UCL	1028
95% Modified-t UCL (Johnson-1978)	730.6	99% Chebyshev (MVUE) UCL	1321

Gamma Distribution Test		Data Distribution
k star (bias corrected)	3.013	Data appear Gamma Distributed at 5% Significance Level
Theta Star	180.2	
MLE of Mean	542.8	
MLE of Standard Deviation	312.7	
nu star	72.32	
Approximate Chi Square Value (.05)	53.73	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 705.3
Adjusted Chi Square Value	51.3	95% Jackknife UCL 720.3
		95% Standard Bootstrap UCL 692.2
Anderson-Darling Test Statistic	0.576	95% Bootstrap-t UCL 884
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL 1332
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL 709.5
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL 787.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 973.5
		97.5% Chebyshev(Mean, Sd) UCL 1160
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 1526
95% Approximate Gamma UCL	730.5	
95% Adjusted Gamma UCL	765.2	

Potential UCL to Use		Use 95% Approximate Gamma UCL	730.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	11.8	Minimum of Log Data	2.468
Maximum	78.6	Maximum of Log Data	4.364
Mean	63.28	Mean of log Data	4.071
Median	65	SD of log Data	0.509
SD	16.91		
Coefficient of Variation	0.267		
Skewness	-2.931		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.56	Shapiro Wilk Test Statistic	0.437
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.05	95% H-UCL	92.85
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	109.2
95% Adjusted-CLT UCL (Chen-1995)	66.9	97.5% Chebyshev (MVUE) UCL	127.9
95% Modified-t UCL (Johnson-1978)	71.36	99% Chebyshev (MVUE) UCL	164.7

Gamma Distribution Test		Data Distribution
k star (bias corrected)	5.065	Data do not follow a Discernable Distribution (0.05)
Theta Star	12.49	
MLE of Mean	63.28	
MLE of Standard Deviation	28.12	
nu star	121.6	
Approximate Chi Square Value (.05)	97.1	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 71.31
Adjusted Chi Square Value	93.76	95% Jackknife UCL 72.05
		95% Standard Bootstrap UCL 71.09
Anderson-Darling Test Statistic	2.932	95% Bootstrap-t UCL 69.35
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL 68.44
Kolmogorov-Smirnov Test Statistic	0.495	95% Percentile Bootstrap UCL 69.38
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL 68.59
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 84.56
		97.5% Chebyshev(Mean, Sd) UCL 93.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 111.9
95% Approximate Gamma UCL	79.22	
95% Adjusted Gamma UCL	82.04	

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	84.56
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	16.99	Maximum of Log Data	2.833
Mean	9.404	Mean of log Data	1.821
Median	10	SD of log Data	1.365
SD	4.723		
Coefficient of Variation	0.502		
Skewness	-1.014		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.783	Shapiro Wilk Test Statistic	0.569
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.85	95% H-UCL	69.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.76
95% Adjusted-CLT UCL (Chen-1995)	11.22	97.5% Chebyshev (MVUE) UCL	50.98
95% Modified-t UCL (Johnson-1978)	11.79	99% Chebyshev (MVUE) UCL	73.03

Gamma Distribution Test		Data Distribution
k star (bias corrected)	1.055	Data do not follow a Discernable Distribution (0.05)
Theta Star	8.916	
MLE of Mean	9.404	
MLE of Standard Deviation	9.157	
nu star	25.32	
Approximate Chi Square Value (.05)	14.85	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 11.65
Adjusted Chi Square Value	13.64	95% Jackknife UCL 11.85
		95% Standard Bootstrap UCL 11.59
Anderson-Darling Test Statistic	2.444	95% Bootstrap-t UCL 11.37
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL 11.46
Kolmogorov-Smirnov Test Statistic	0.475	95% Percentile Bootstrap UCL 11.39
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL 11.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 15.35
		97.5% Chebyshev(Mean, Sd) UCL 17.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 22.97
95% Approximate Gamma UCL	16.03	
95% Adjusted Gamma UCL	17.45	

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	15.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.394	Minimum of Log Data	-0.931
Maximum	0.891	Maximum of Log Data	-0.115
Mean	0.652	Mean of log Data	-0.442
Median	0.652	SD of log Data	0.178
SD	0.106		
Coefficient of Variation	0.163		
Skewness	-0.303		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk Test Statistic	0.594
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.707	95% H-UCL	0.721
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.799
95% Adjusted-CLT UCL (Chen-1995)	0.699	97.5% Chebyshev (MVUE) UCL	0.863
95% Modified-t UCL (Johnson-1978)	0.706	99% Chebyshev (MVUE) UCL	0.988

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	27.83	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0234		
MLE of Mean	0.652		
MLE of Standard Deviation	0.124		
nu star	668		
Approximate Chi Square Value (.05)	609	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.702
Adjusted Chi Square Value	600.4	95% Jackknife UCL	0.707
		95% Standard Bootstrap UCL	0.701
Anderson-Darling Test Statistic	2.572	95% Bootstrap-t UCL	0.697
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.711
Kolmogorov-Smirnov Test Statistic	0.439	95% Percentile Bootstrap UCL	0.695
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.693
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.785
		97.5% Chebyshev(Mean, Sd) UCL	0.843
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.957
95% Approximate Gamma UCL	0.715		
95% Adjusted Gamma UCL	0.725		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.707
	or 95% Modified-t UCL	0.706

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-13.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	4.7	Minimum of Log Data	1.548
Maximum	11	Maximum of Log Data	2.398
Mean	9.235	Mean of log Data	2.201
Median	9.235	SD of log Data	0.231
SD	1.81		
Coefficient of Variation	0.196		
Skewness	-1.172		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.794
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.06	95% H-UCL	10.39
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.68
95% Adjusted-CLT UCL (Chen-1995)	9.853	97.5% Chebyshev (MVUE) UCL	12.73
95% Modified-t UCL (Johnson-1978)	10.03	99% Chebyshev (MVUE) UCL	14.79

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.24	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.506		
MLE of Mean	9.235		
MLE of Standard Deviation	2.162		
nu star	547.2		
Approximate Chi Square Value (.05)	494	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10
Adjusted Chi Square Value	487.8	95% Jackknife UCL	10.06
		95% Standard Bootstrap UCL	9.976
Anderson-Darling Test Statistic	0.957	95% Bootstrap-t UCL	9.946
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	9.874
Kolmogorov-Smirnov Test Statistic	0.261	95% Percentile Bootstrap UCL	9.963
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9.887
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.27
		97.5% Chebyshev(Mean, Sd) UCL	12.15
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.89
95% Approximate Gamma UCL	10.23		
95% Adjusted Gamma UCL	10.36		
Potential UCL to Use		Use 95% Student's-t UCL	10.06
		or 95% Modified-t UCL	10.03

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	39.44	Minimum of Log Data	3.675
Maximum	85	Maximum of Log Data	4.443
Mean	67.35	Mean of log Data	4.181
Median	67.35	SD of log Data	0.254
SD	15.73		
Coefficient of Variation	0.234		
Skewness	-0.375		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.878	Shapiro Wilk Test Statistic	0.867
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.5	95% H-UCL	76.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.92
95% Adjusted-CLT UCL (Chen-1995)	73.61	97.5% Chebyshev (MVUE) UCL	95.33
95% Modified-t UCL (Johnson-1978)	74.44	99% Chebyshev (MVUE) UCL	111.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.26	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	4.723		
MLE of Mean	67.35		
MLE of Standard Deviation	17.83		
nu star	427.8		
Approximate Chi Square Value (.05)	380.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	74.03
Adjusted Chi Square Value	375.4	95% Jackknife UCL	74.5
		95% Standard Bootstrap UCL	73.6
Anderson-Darling Test Statistic	0.78	95% Bootstrap-t UCL	74.05
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	73.32
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	73.6
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	73.6
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.05
		97.5% Chebyshev(Mean, Sd) UCL	92.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	107.8
95% Approximate Gamma UCL	75.65		
95% Adjusted Gamma UCL	76.75		

Potential UCL to Use		Use 95% Approximate Gamma UCL	75.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	278	Minimum of Log Data	5.628
Maximum	1411	Maximum of Log Data	7.252
Mean	481.9	Mean of log Data	6.089
Median	458.6	SD of log Data	0.389
SD	271.1		
Coefficient of Variation	0.563		
Skewness	3.21E+00		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.58	Shapiro Wilk Test Statistic	0.803
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	605.1	95% H-UCL	583.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	684.4
95% Adjusted-CLT UCL (Chen-1995)	659	97.5% Chebyshev (MVUE) UCL	775.7
95% Modified-t UCL (Johnson-1978)	614.8	99% Chebyshev (MVUE) UCL	955.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.711	Data do not follow a Discernable Distribution (0.05)	
Theta Star	102.3		
MLE of Mean	481.9		
MLE of Standard Deviation	222		
nu star	141.3		
Approximate Chi Square Value (.05)	114.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	597
Adjusted Chi Square Value	111.9	95% Jackknife UCL	605.1
		95% Standard Bootstrap UCL	594.1
Anderson-Darling Test Statistic	1.332	95% Bootstrap-t UCL	765.3
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	1087
Kolmogorov-Smirnov Test Statistic	0.312	95% Percentile Bootstrap UCL	613.6
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	677.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	786.9
		97.5% Chebyshev(Mean, Sd) UCL	919
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1178
95% Approximate Gamma UCL	592.9		
95% Adjusted Gamma UCL	608.5		

Potential UCL to Use		
	Use 95% Student's-t UCL	605.1
	or 95% Modified-t UCL	614.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	10.9	Minimum of Log Data	2.389
Maximum	85.52	Maximum of Log Data	4.449
Mean	61.14	Mean of log Data	4.048
Median	62.93	SD of log Data	0.466
SD	15.15		
Coefficient of Variation	0.248		
Skewness	-2.655		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.559	Shapiro Wilk Test Statistic	0.414
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.03	95% H-UCL	82.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.5
95% Adjusted-CLT UCL (Chen-1995)	64.71	97.5% Chebyshev (MVUE) UCL	112.3
95% Modified-t UCL (Johnson-1978)	67.58	99% Chebyshev (MVUE) UCL	141.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.311	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.688		
MLE of Mean	61.14		
MLE of Standard Deviation	24.34		
nu star	189.3		
Approximate Chi Square Value (.05)	158.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	67.57
Adjusted Chi Square Value	155	95% Jackknife UCL	68.03
		95% Standard Bootstrap UCL	67.13
Anderson-Darling Test Statistic	3.669	95% Bootstrap-t UCL	65.83
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	65.52
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	66.43
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	65.44
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.19
		97.5% Chebyshev(Mean, Sd) UCL	85.56
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	100.1
95% Approximate Gamma UCL	73.03		
95% Adjusted Gamma UCL	74.67		

Potential UCL to Use		
	Use 95% Student's-t UCL	68.03
	or 95% Modified-t UCL	67.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0077	Minimum of Log Data	-4.867
Maximum	0.0913	Maximum of Log Data	-2.393
Mean	0.0495	Mean of log Data	-3.089
Median	0.0495	SD of log Data	0.517
SD	0.0158		
Coefficient of Variation	0.319		
Skewness	-3.11E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.434
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0567	95% H-UCL	0.0694
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0825
95% Adjusted-CLT UCL (Chen-1995)	0.0562	97.5% Chebyshev (MVUE) UCL	0.0959
95% Modified-t UCL (Johnson-1978)	0.0567	99% Chebyshev (MVUE) UCL	0.122

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	4.978	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.00995			
MLE of Mean	0.0495			
MLE of Standard Deviation	0.0222			
nu star	149.3			
Approximate Chi Square Value (.05)	122.1	Nonparametric Statistics		
Adjusted Level of Significance	0.0324	95% CLT UCL		0.0562
Adjusted Chi Square Value	119.1	95% Jackknife UCL		0.0567
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.996	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.0673
		97.5% Chebyshev(Mean, Sd) UCL		0.075
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.0901
95% Approximate Gamma UCL	0.0606			
95% Adjusted Gamma UCL	0.0621			
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL		0.0673

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-14.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Aluminum

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	11500	Minimum of Log Data	9.35
Maximum	13400	Maximum of Log Data	9.503
Mean	12450	Mean of log Data	9.429
Median	12450	SD of log Data	0.0312
SD	387.8		
Coefficient of Variation	0.0312		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12642	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12920
95% Adjusted-CLT UCL (Chen-1995)	12627	97.5% Chebyshev (MVUE) UCL	13124
95% Modified-t UCL (Johnson-1978)	12642	99% Chebyshev (MVUE) UCL	13523
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	856.4	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.54		
MLE of Mean	12450		
MLE of Standard Deviation	425.4		
nu star	22267		
Approximate Chi Square Value (.05)	21921	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	12627
Adjusted Chi Square Value	21872	95% Jackknife UCL	12642
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.074	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.426	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12919
		97.5% Chebyshev(Mean, Sd) UCL	13122
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13520
95% Approximate Gamma UCL	12646		
95% Adjusted Gamma UCL	12675		
Potential UCL to Use		Use 95% Student's-t UCL	12642
		or 95% Modified-t UCL	12642

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	7.57	Minimum of Log Data	2.024
Maximum	12.53	Maximum of Log Data	2.528
Mean	10.06	Mean of log Data	2.296
Median	10.32	SD of log Data	0.165
SD	1.608		
Coefficient of Variation	0.16		
Skewness	-0.21		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.953	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.85	95% H-UCL	10.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.07
95% Adjusted-CLT UCL (Chen-1995)	10.76	97.5% Chebyshev (MVUE) UCL	12.95
95% Modified-t UCL (Johnson-1978)	10.85	99% Chebyshev (MVUE) UCL	14.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	31.44	Data appear Normal at 5% Significance Level	
Theta Star	0.32		
MLE of Mean	10.06		
MLE of Standard Deviation	1.794		
nu star	817.6		
Approximate Chi Square Value (.05)	752.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.79
Adjusted Chi Square Value	743.3	95% Jackknife UCL	10.85
		95% Standard Bootstrap UCL	10.77
Anderson-Darling Test Statistic	0.324	95% Bootstrap-t UCL	10.83
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	10.75
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	10.75
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	10.78
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12
		97.5% Chebyshev(Mean, Sd) UCL	12.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.5
95% Approximate Gamma UCL	10.93		
95% Adjusted Gamma UCL	11.06		

Potential UCL to Use		Use 95% Student's-t UCL	10.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	34.01	Minimum of Log Data	3.527
Maximum	85	Maximum of Log Data	4.443
Mean	52.33	Mean of log Data	3.912
Median	44.99	SD of log Data	0.304
SD	17.39		
Coefficient of Variation	0.332		
Skewness	1.098		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.93	95% H-UCL	61.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.6
95% Adjusted-CLT UCL (Chen-1995)	61.83	97.5% Chebyshev (MVUE) UCL	79.99
95% Modified-t UCL (Johnson-1978)	61.17	99% Chebyshev (MVUE) UCL	96.48

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.671	Data appear Lognormal at 5% Significance Level	
Theta Star	6.035		
MLE of Mean	52.33		
MLE of Standard Deviation	17.77		
nu star	225.4		
Approximate Chi Square Value (.05)	191.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	60.26
Adjusted Chi Square Value	187.3	95% Jackknife UCL	60.93
		95% Standard Bootstrap UCL	59.85
Anderson-Darling Test Statistic	0.771	95% Bootstrap-t UCL	64.92
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	62.37
Kolmogorov-Smirnov Test Statistic	0.255	95% Percentile Bootstrap UCL	60.18
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	61.98
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.35
		97.5% Chebyshev(Mean, Sd) UCL	82.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	100.3
95% Approximate Gamma UCL	61.55		
95% Adjusted Gamma UCL	63		

Potential UCL to Use		
	Use 95% Student's-t UCL	60.93
	or 95% Modified-t UCL	61.17
	or 95% H-UCL	61.97

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	170.7	Minimum of Log Data	5.14
Maximum	1420	Maximum of Log Data	7.258
Mean	519.5	Mean of log Data	6.102
Median	474.3	SD of log Data	0.561
SD	327		
Coefficient of Variation	0.63		
Skewness	1.875		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.827	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	681.2	95% H-UCL	745
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	876.9
95% Adjusted-CLT UCL (Chen-1995)	719.1	97.5% Chebyshev (MVUE) UCL	1033
95% Modified-t UCL (Johnson-1978)	689.1	99% Chebyshev (MVUE) UCL	1340

Gamma Distribution Test		Data Distribution
k star (bias corrected)	2.714	Data appear Gamma Distributed at 5% Significance Level
Theta Star	191.4	
MLE of Mean	519.5	
MLE of Standard Deviation	315.3	
nu star	70.58	
Approximate Chi Square Value (.05)	52.24	Nonparametric Statistics
Adjusted Level of Significance	0.0301	95% CLT UCL 668.7
Adjusted Chi Square Value	49.99	95% Jackknife UCL 681.2
		95% Standard Bootstrap UCL 665
Anderson-Darling Test Statistic	0.271	95% Bootstrap-t UCL 779.8
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL 1321
Kolmogorov-Smirnov Test Statistic	0.147	95% Percentile Bootstrap UCL 666.4
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL 732.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 914.9
		97.5% Chebyshev(Mean, Sd) UCL 1086
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 1422
95% Approximate Gamma UCL	701.9	
95% Adjusted Gamma UCL	733.4	

Potential UCL to Use		Use 95% Approximate Gamma UCL	701.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0332	Minimum of Log Data	-3.405
Maximum	10	Maximum of Log Data	2.303
Mean	8.386	Mean of log Data	1.446
Median	10	SD of log Data	2.068
SD	3.715		
Coefficient of Variation	0.443		
Skewness	-2.151		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.479	Shapiro Wilk Test Statistic	0.459
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.22	95% H-UCL	694.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.81
95% Adjusted-CLT UCL (Chen-1995)	9.424	97.5% Chebyshev (MVUE) UCL	122.3
95% Modified-t UCL (Johnson-1978)	10.12	99% Chebyshev (MVUE) UCL	180.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.715	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.72		
MLE of Mean	8.386		
MLE of Standard Deviation	9.915		
nu star	18.6		
Approximate Chi Square Value (.05)	9.827	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.08
Adjusted Chi Square Value	8.93	95% Jackknife UCL	10.22
		95% Standard Bootstrap UCL	9.931
Anderson-Darling Test Statistic	4.025	95% Bootstrap-t UCL	9.665
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	9.494
Kolmogorov-Smirnov Test Statistic	0.51	95% Percentile Bootstrap UCL	9.837
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	9.235
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.88
		97.5% Chebyshev(Mean, Sd) UCL	14.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.64
95% Approximate Gamma UCL	15.87		
95% Adjusted Gamma UCL	17.47		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.64
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	11	Minimum of Log Data	2.398
Maximum	70.85	Maximum of Log Data	4.261
Mean	57.2	Mean of log Data	3.913
Median	65	SD of log Data	0.657
SD	20.39		
Coefficient of Variation	0.356		
Skewness	-2.148		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.496	Shapiro Wilk Test Statistic	0.472
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.28	95% H-UCL	96.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	111.4
95% Adjusted-CLT UCL (Chen-1995)	62.91	97.5% Chebyshev (MVUE) UCL	133.2
95% Modified-t UCL (Johnson-1978)	66.72	99% Chebyshev (MVUE) UCL	176.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.054	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.73		
MLE of Mean	57.2		
MLE of Standard Deviation	32.73		
nu star	79.41		
Approximate Chi Square Value (.05)	59.88	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	66.51
Adjusted Chi Square Value	57.47	95% Jackknife UCL	67.28
		95% Standard Bootstrap UCL	66.08
Anderson-Darling Test Statistic	3.641	95% Bootstrap-t UCL	64.09
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	63.21
Kolmogorov-Smirnov Test Statistic	0.511	95% Percentile Bootstrap UCL	65.45
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	62.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.86
		97.5% Chebyshev(Mean, Sd) UCL	92.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	113.5
95% Approximate Gamma UCL	75.86		
95% Adjusted Gamma UCL	79.05		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	81.86
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	30.8	Minimum of Log Data	3.428
Maximum	38	Maximum of Log Data	3.638
Mean	34.4	Mean of log Data	3.537
Median	34.4	SD of log Data	0.0429
SD	1.47		
Coefficient of Variation	0.0427		
Skewness	2.14E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.13	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.19
95% Adjusted-CLT UCL (Chen-1995)	35.07	97.5% Chebyshev (MVUE) UCL	36.96
95% Modified-t UCL (Johnson-1978)	35.13	99% Chebyshev (MVUE) UCL	38.48

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	454.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0757		
MLE of Mean	34.4		
MLE of Standard Deviation	1.614		
nu star	11810		
Approximate Chi Square Value (.05)	11558	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	35.07
Adjusted Chi Square Value	11523	95% Jackknife UCL	35.13
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.075	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.429	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	36.18
		97.5% Chebyshev(Mean, Sd) UCL	36.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	38.46
95% Approximate Gamma UCL	35.15		
95% Adjusted Gamma UCL	35.26		

Potential UCL to Use		
	Use 95% Student's-t UCL	35.13
	or 95% Modified-t UCL	35.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-15.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	5.55	Minimum of Log Data	1.714
Maximum	11.74	Maximum of Log Data	2.463
Mean	8.086	Mean of log Data	2.063
Median	8.086	SD of log Data	0.237
SD	1.967		
Coefficient of Variation	0.243		
Skewness	0.606		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.948	95% H-UCL	9.053
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.18
95% Adjusted-CLT UCL (Chen-1995)	8.974	97.5% Chebyshev (MVUE) UCL	11.09
95% Modified-t UCL (Johnson-1978)	8.96	99% Chebyshev (MVUE) UCL	12.88

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.37	Data appear Normal at 5% Significance Level	
Theta Star	0.526		
MLE of Mean	8.086		
MLE of Standard Deviation	2.062		
nu star	492		
Approximate Chi Square Value (.05)	441.5	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	8.895
Adjusted Chi Square Value	436.1	95% Jackknife UCL	8.948
		95% Standard Bootstrap UCL	8.87
Anderson-Darling Test Statistic	0.477	95% Bootstrap-t UCL	9.013
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	8.945
Kolmogorov-Smirnov Test Statistic	0.154	95% Percentile Bootstrap UCL	8.857
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	8.991
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.23
		97.5% Chebyshev(Mean, Sd) UCL	11.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.98
95% Approximate Gamma UCL	9.01		
95% Adjusted Gamma UCL	9.122		
Potential UCL to Use		Use 95% Student's-t UCL	8.948

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	34.12	Minimum of Log Data	3.53
Maximum	85	Maximum of Log Data	4.443
Mean	54.93	Mean of log Data	3.968
Median	51	SD of log Data	0.277
SD	16.4		
Coefficient of Variation	0.299		
Skewness	1.069		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	62.12	95% H-UCL	62.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.58
95% Adjusted-CLT UCL (Chen-1995)	62.85	97.5% Chebyshev (MVUE) UCL	78.83
95% Modified-t UCL (Johnson-1978)	62.3	99% Chebyshev (MVUE) UCL	93.06

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.94	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.019		
MLE of Mean	54.93		
MLE of Standard Deviation	16.6		
nu star	350.2		
Approximate Chi Square Value (.05)	307.9	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	61.68
Adjusted Chi Square Value	303.3	95% Jackknife UCL	62.12
		95% Standard Bootstrap UCL	61.5
Anderson-Darling Test Statistic	0.749	95% Bootstrap-t UCL	63.69
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	62.21
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	61.68
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	62.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.8
		97.5% Chebyshev(Mean, Sd) UCL	80.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	95.73
95% Approximate Gamma UCL	62.49		
95% Adjusted Gamma UCL	63.42		

Potential UCL to Use	Use 95% Approximate Gamma UCL	62.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	195.9	Minimum of Log Data	5.278
Maximum	929.7	Maximum of Log Data	6.835
Mean	517.9	Mean of log Data	6.171
Median	497.6	SD of log Data	0.418
SD	209.4		
Coefficient of Variation	0.404		
Skewness	0.765		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	609.7	95% H-UCL	646.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	761.9
95% Adjusted-CLT UCL (Chen-1995)	614.7	97.5% Chebyshev (MVUE) UCL	866.8
95% Modified-t UCL (Johnson-1978)	611.3	99% Chebyshev (MVUE) UCL	1073

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.357	Data appear Normal at 5% Significance Level	
Theta Star	96.67		
MLE of Mean	517.9		
MLE of Standard Deviation	223.8		
nu star	171.4		
Approximate Chi Square Value (.05)	142.2	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	604
Adjusted Chi Square Value	139.1	95% Jackknife UCL	609.7
		95% Standard Bootstrap UCL	601
Anderson-Darling Test Statistic	0.537	95% Bootstrap-t UCL	629.1
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	619.5
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	605.2
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	610.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	746.1
		97.5% Chebyshev(Mean, Sd) UCL	844.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1039
95% Approximate Gamma UCL	624.6		
95% Adjusted Gamma UCL	638.2		

Potential UCL to Use	Use 95% Student's-t UCL	609.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	6.7	Minimum of Log Data	1.902
Maximum	88.34	Maximum of Log Data	4.481
Mean	62.31	Mean of log Data	4.044
Median	65	SD of log Data	0.577
SD	16.02		
Coefficient of Variation	0.257		
Skewness	-2.856		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.488	Shapiro Wilk Test Statistic	0.358
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.33	95% H-UCL	92.53
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.1
95% Adjusted-CLT UCL (Chen-1995)	65.84	97.5% Chebyshev (MVUE) UCL	128.9
95% Modified-t UCL (Johnson-1978)	68.86	99% Chebyshev (MVUE) UCL	166

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.763	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.08		
MLE of Mean	62.31		
MLE of Standard Deviation	28.55		
nu star	152.4		
Approximate Chi Square Value (.05)	124.9	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	68.9
Adjusted Chi Square Value	122	95% Jackknife UCL	69.33
		95% Standard Bootstrap UCL	68.81
Anderson-Darling Test Statistic	4.544	95% Bootstrap-t UCL	67.15
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	66.6
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	67.58
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	66.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.77
		97.5% Chebyshev(Mean, Sd) UCL	87.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	102.2
95% Approximate Gamma UCL	76.05		
95% Adjusted Gamma UCL	77.82		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	79.77

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.031	Minimum of Log Data	-3.474
Maximum	11.68	Maximum of Log Data	2.458
Mean	9.362	Mean of log Data	1.939
Median	10	SD of log Data	1.444
SD	2.542		
Coefficient of Variation	0.272		
Skewness	-3.698		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.42	Shapiro Wilk Test Statistic	0.297
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.48	95% H-UCL	71.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.39
95% Adjusted-CLT UCL (Chen-1995)	9.78	97.5% Chebyshev (MVUE) UCL	63.15
95% Modified-t UCL (Johnson-1978)	10.38	99% Chebyshev (MVUE) UCL	90.19

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.527	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.131		
MLE of Mean	9.362		
MLE of Standard Deviation	7.577		
nu star	48.86		
Approximate Chi Square Value (.05)	33.82	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	10.41
Adjusted Chi Square Value	32.39	95% Jackknife UCL	10.48
		95% Standard Bootstrap UCL	10.34
Anderson-Darling Test Statistic	5.385	95% Bootstrap-t UCL	10.09
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	10
Kolmogorov-Smirnov Test Statistic	0.536	95% Percentile Bootstrap UCL	10.13
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	10.03
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.13
		97.5% Chebyshev(Mean, Sd) UCL	13.33
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.69
95% Approximate Gamma UCL	13.53		
95% Adjusted Gamma UCL	14.12		

Potential UCL to Use		
Recommended UCL exceeds the maximum observation	Use 95% Chebyshev (Mean, Sd) UCL	12.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-16.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Antimony

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.47
Maximum	0.74	Maximum of Log Data	-0.301
Mean	0.467	Mean of log Data	-0.783
Median	0.467	SD of log Data	0.218
SD	0.0938		
Coefficient of Variation	0.201		
Skewness	0.656		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.552	Shapiro Wilk Test Statistic	0.535
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.508	95% H-UCL	0.518
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.579
95% Adjusted-CLT UCL (Chen-1995)	0.509	97.5% Chebyshev (MVUE) UCL	0.628
95% Modified-t UCL (Johnson-1978)	0.508	99% Chebyshev (MVUE) UCL	0.723

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.97	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0234		
MLE of Mean	0.467		
MLE of Standard Deviation	0.104		
nu star	639.1		
Approximate Chi Square Value (.05)	581.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.505
Adjusted Chi Square Value	575.2	95% Jackknife UCL	0.508
		95% Standard Bootstrap UCL	0.505
Anderson-Darling Test Statistic	3.759	95% Bootstrap-t UCL	0.51
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	0.535
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.501
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.511
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.569
		97.5% Chebyshev(Mean, Sd) UCL	0.613
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.7
95% Approximate Gamma UCL	0.513		
95% Adjusted Gamma UCL	0.519		
Potential UCL to Use		Use 95% Student's-t UCL	0.508
		or 95% Modified-t UCL	0.508

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	5.33	Minimum of Log Data	1.673
Maximum	17.8	Maximum of Log Data	2.879
Mean	9.468	Mean of log Data	2.193
Median	9.04	SD of log Data	0.339
SD	3.335		
Coefficient of Variation	0.352		
Skewness	1.016		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.93	95% H-UCL	11.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13
95% Adjusted-CLT UCL (Chen-1995)	11.07	97.5% Chebyshev (MVUE) UCL	14.54
95% Modified-t UCL (Johnson-1978)	10.97	99% Chebyshev (MVUE) UCL	17.55

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.614	Data appear Normal at 5% Significance Level	
Theta Star	1.244		
MLE of Mean	9.468		
MLE of Standard Deviation	3.431		
nu star	243.6		
Approximate Chi Square Value (.05)	208.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.84
Adjusted Chi Square Value	204.8	95% Jackknife UCL	10.93
		95% Standard Bootstrap UCL	10.79
Anderson-Darling Test Statistic	0.293	95% Bootstrap-t UCL	11.23
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	11.6
Kolmogorov-Smirnov Test Statistic	0.135	95% Percentile Bootstrap UCL	10.87
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	11.05
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.1
		97.5% Chebyshev(Mean, Sd) UCL	14.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.77
95% Approximate Gamma UCL	11.06		
95% Adjusted Gamma UCL	11.26		

Potential UCL to Use		Use 95% Student's-t UCL	10.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.45	Minimum of Log Data	-0.799
Maximum	0.87	Maximum of Log Data	-0.139
Mean	0.61	Mean of log Data	-0.502
Median	0.61	SD of log Data	0.129
SD	0.0829		
Coefficient of Variation	0.136		
Skewness	1.666		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.616
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.646	95% H-UCL	0.647
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.696
95% Adjusted-CLT UCL (Chen-1995)	0.653	97.5% Chebyshev (MVUE) UCL	0.733
95% Modified-t UCL (Johnson-1978)	0.648	99% Chebyshev (MVUE) UCL	0.806

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	50.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.012		
MLE of Mean	0.61		
MLE of Standard Deviation	0.0855		
nu star	1628		
Approximate Chi Square Value (.05)	1535	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.644
Adjusted Chi Square Value	1525	95% Jackknife UCL	0.646
		95% Standard Bootstrap UCL	0.643
Anderson-Darling Test Statistic	3.324	95% Bootstrap-t UCL	0.655
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	0.85
Kolmogorov-Smirnov Test Statistic	0.421	95% Percentile Bootstrap UCL	0.646
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.649
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.7
		97.5% Chebyshev(Mean, Sd) UCL	0.739
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.816
95% Approximate Gamma UCL	0.647		
95% Adjusted Gamma UCL	0.651		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.646
	or 95% Modified-t UCL	0.648

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	12.7	Minimum of Log Data	2.542
Maximum	85	Maximum of Log Data	4.443
Mean	48.45	Mean of log Data	3.795
Median	44.24	SD of log Data	0.451
SD	20.1		
Coefficient of Variation	0.415		
Skewness	0.869		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.824	Shapiro Wilk Test Statistic	0.833
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.26	95% H-UCL	62.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	73.51
95% Adjusted-CLT UCL (Chen-1995)	57.88	97.5% Chebyshev (MVUE) UCL	84.17
95% Modified-t UCL (Johnson-1978)	57.44	99% Chebyshev (MVUE) UCL	105.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.91	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.868		
MLE of Mean	48.45		
MLE of Standard Deviation	21.87		
nu star	157.1		
Approximate Chi Square Value (.05)	129.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	56.71
Adjusted Chi Square Value	126.2	95% Jackknife UCL	57.26
		95% Standard Bootstrap UCL	56.36
Anderson-Darling Test Statistic	1.063	95% Bootstrap-t UCL	58.3
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	58.5
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	56.74
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	58.01
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.35
		97.5% Chebyshev(Mean, Sd) UCL	79.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	98.44
95% Approximate Gamma UCL	58.95		
95% Adjusted Gamma UCL	60.29		

Potential UCL to Use		
	Use 95% Student's-t UCL	57.26
	or 95% Modified-t UCL	57.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	203.4	Minimum of Log Data	5.315
Maximum	3861	Maximum of Log Data	8.259
Mean	715.2	Mean of log Data	6.21
Median	427.7	SD of log Data	0.73
SD	922		
Coefficient of Variation	1.289		
Skewness	3.124		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.507	Shapiro Wilk Test Statistic	0.79
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1119	95% H-UCL	1006
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1174
95% Adjusted-CLT UCL (Chen-1995)	1287	97.5% Chebyshev (MVUE) UCL	1407
95% Modified-t UCL (Johnson-1978)	1149	99% Chebyshev (MVUE) UCL	1864

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	558.7		
MLE of Mean	715.2		
MLE of Standard Deviation	632.1		
nu star	40.96		
Approximate Chi Square Value (.05)	27.29	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	1094
Adjusted Chi Square Value	26.02	95% Jackknife UCL	1119
		95% Standard Bootstrap UCL	1078
Anderson-Darling Test Statistic	2.151	95% Bootstrap-t UCL	3283
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	3387
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	1119
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	1431
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1720
		97.5% Chebyshev(Mean, Sd) UCL	2155
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3009
95% Approximate Gamma UCL	1073		
95% Adjusted Gamma UCL	1126		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1720

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	8.5	Minimum of Log Data	2.14
Maximum	108.4	Maximum of Log Data	4.686
Mean	60.63	Mean of log Data	3.952
Median	65	SD of log Data	0.718
SD	23.17		
Coefficient of Variation	0.382		
Skewness	-1.048		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.666	Shapiro Wilk Test Statistic	0.527
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.79	95% H-UCL	103.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.7
95% Adjusted-CLT UCL (Chen-1995)	68.54	97.5% Chebyshev (MVUE) UCL	144.3
95% Modified-t UCL (Johnson-1978)	70.54	99% Chebyshev (MVUE) UCL	190.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.822	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.49		
MLE of Mean	60.63		
MLE of Standard Deviation	36.09		
nu star	90.3		
Approximate Chi Square Value (.05)	69.39	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	70.16
Adjusted Chi Square Value	67.3	95% Jackknife UCL	70.79
		95% Standard Bootstrap UCL	70
Anderson-Darling Test Statistic	3.602	95% Bootstrap-t UCL	69.07
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	69.23
Kolmogorov-Smirnov Test Statistic	0.434	95% Percentile Bootstrap UCL	69.96
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	68.59
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.89
		97.5% Chebyshev(Mean, Sd) UCL	96.81
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	118.3
95% Approximate Gamma UCL	78.9		
95% Adjusted Gamma UCL	81.35		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	85.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.028	Minimum of Log Data	-3.576
Maximum	12.32	Maximum of Log Data	2.511
Mean	9.04	Mean of log Data	1.604
Median	10	SD of log Data	1.991
SD	3.579		
Coefficient of Variation	0.396		
Skewness	-2.322		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.539	Shapiro Wilk Test Statistic	0.424
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.61	95% H-UCL	356.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	95.86
95% Adjusted-CLT UCL (Chen-1995)	9.957	97.5% Chebyshev (MVUE) UCL	125.6
95% Modified-t UCL (Johnson-1978)	10.52	99% Chebyshev (MVUE) UCL	184.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.83	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.89		
MLE of Mean	9.04		
MLE of Standard Deviation	9.924		
nu star	26.55		
Approximate Chi Square Value (.05)	15.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.51
Adjusted Chi Square Value	14.87	95% Jackknife UCL	10.61
		95% Standard Bootstrap UCL	10.49
Anderson-Darling Test Statistic	4.963	95% Bootstrap-t UCL	10.24
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	10.05
Kolmogorov-Smirnov Test Statistic	0.545	95% Percentile Bootstrap UCL	10.35
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	10.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.94
		97.5% Chebyshev(Mean, Sd) UCL	14.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.94
95% Approximate Gamma UCL	15.19		
95% Adjusted Gamma UCL	16.15		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.94
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	0.63	Maximum of Log Data	-0.462
Mean	0.34	Mean of log Data	-1.115
Median	0.34	SD of log Data	0.288
SD	0.0939		
Coefficient of Variation	0.276		
Skewness	1.442		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.582	Shapiro Wilk Test Statistic	0.598
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.381	95% H-UCL	0.392
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.449
95% Adjusted-CLT UCL (Chen-1995)	0.388	97.5% Chebyshev (MVUE) UCL	0.496
95% Modified-t UCL (Johnson-1978)	0.383	99% Chebyshev (MVUE) UCL	0.588

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.42	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0298		
MLE of Mean	0.34		
MLE of Standard Deviation	0.101		
nu star	365.5		
Approximate Chi Square Value (.05)	322.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	0.379
Adjusted Chi Square Value	317.5	95% Jackknife UCL	0.381
		95% Standard Bootstrap UCL	0.379
Anderson-Darling Test Statistic	3.361	95% Bootstrap-t UCL	0.388
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.603
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.378
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	0.389
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.442
		97.5% Chebyshev(Mean, Sd) UCL	0.487
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.574
95% Approximate Gamma UCL	0.386		
95% Adjusted Gamma UCL	0.391		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.381
	or 95% Modified-t UCL	0.383

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	24.9	Minimum of Log Data	3.215
Maximum	41.1	Maximum of Log Data	3.716
Mean	31	Mean of log Data	3.429
Median	31	SD of log Data	0.0988
SD	3.217		
Coefficient of Variation	0.104		
Skewness	1.692		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.582	Shapiro Wilk Test Statistic	0.61
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.41	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.34
95% Adjusted-CLT UCL (Chen-1995)	32.69	97.5% Chebyshev (MVUE) UCL	35.78
95% Modified-t UCL (Johnson-1978)	32.47	99% Chebyshev (MVUE) UCL	38.62

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	86.56	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.358		
MLE of Mean	31		
MLE of Standard Deviation	3.332		
nu star	2770		
Approximate Chi Square Value (.05)	2649	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	32.32
Adjusted Chi Square Value	2635	95% Jackknife UCL	32.41
		95% Standard Bootstrap UCL	32.3
Anderson-Darling Test Statistic	3.334	95% Bootstrap-t UCL	32.75
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	40.25
Kolmogorov-Smirnov Test Statistic	0.425	95% Percentile Bootstrap UCL	32.26
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	32.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.51
		97.5% Chebyshev(Mean, Sd) UCL	36.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	39
95% Approximate Gamma UCL	32.42		
95% Adjusted Gamma UCL	32.59		

Potential UCL to Use		
	Use 95% Student's-t UCL	32.41
	or 95% Modified-t UCL	32.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-17.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6.05	Minimum of Log Data	1.8
Maximum	13.96	Maximum of Log Data	2.636
Mean	10.05	Mean of log Data	2.284
Median	10.05	SD of log Data	0.235
SD	2.125		
Coefficient of Variation	0.211		
Skewness	-0.538		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.15	95% H-UCL	11.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.06
95% Adjusted-CLT UCL (Chen-1995)	10.96	97.5% Chebyshev (MVUE) UCL	14.36
95% Modified-t UCL (Johnson-1978)	11.14	99% Chebyshev (MVUE) UCL	16.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	16.18	Data appear Normal at 5% Significance Level	
Theta Star	0.621		
MLE of Mean	10.05		
MLE of Standard Deviation	2.499		
nu star	388.3		
Approximate Chi Square Value (.05)	343.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.06
Adjusted Chi Square Value	337.2	95% Jackknife UCL	11.15
		95% Standard Bootstrap UCL	11.01
Anderson-Darling Test Statistic	0.964	95% Bootstrap-t UCL	11.02
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	11.06
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	11.04
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.93
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.72
		97.5% Chebyshev(Mean, Sd) UCL	13.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.15
95% Approximate Gamma UCL	11.36		
95% Adjusted Gamma UCL	11.57		
Potential UCL to Use		Use 95% Student's-t UCL	11.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	1.1	Maximum of Log Data	0.0953
Mean	0.565	Mean of log Data	-0.76
Median	0.565	SD of log Data	0.886
SD	0.228		
Coefficient of Variation	0.404		
Skewness	2.55E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.45
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.683	95% H-UCL	1.429
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.448
95% Adjusted-CLT UCL (Chen-1995)	0.673	97.5% Chebyshev (MVUE) UCL	1.787
95% Modified-t UCL (Johnson-1978)	0.683	99% Chebyshev (MVUE) UCL	2.453

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	2.155	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.262			
MLE of Mean	0.565			
MLE of Standard Deviation	0.385			
nu star	51.72			
Approximate Chi Square Value (.05)	36.2	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		0.673
Adjusted Chi Square Value	34.23	95% Jackknife UCL		0.683
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.068	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.852
		97.5% Chebyshev(Mean, Sd) UCL		0.976
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		1.22
95% Approximate Gamma UCL	0.807			
95% Adjusted Gamma UCL	0.854			

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.852

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	-0.009	Log Statistics Not Avaliable
Maximum	0.332	
Mean	0.162	
Median	0.162	
SD	0.0727	
Coefficient of Variation	0.45	
Skewness	0	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.6	Not Available
Shapiro Wilk Critical Value	0.859	

Data not Normal at 5% Significance Level

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.199	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.199	95% Adjusted-CLT UCL (Chen 1995)		0.196
		95% Modified-t UCL (Johnson-1978)		0.199

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.253	95% CLT UCL		0.196
		95% Jackknife UCL		0.199
		95% Standard Bootstrap UCL	N/A	
		95% Bootstrap-t UCL	N/A	
		95% Hall's Bootstrap UCL	N/A	
		95% Percentile Bootstrap UCL	N/A	
		95% BCA Bootstrap UCL	N/A	
		95% Chebyshev(Mean, Sd) UCL		0.253
		97.5% Chebyshev(Mean, Sd) UCL		0.293
		99% Chebyshev(Mean, Sd) UCL		0.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	16.4	Minimum of Log Data	2.797
Maximum	85	Maximum of Log Data	4.443
Mean	46.07	Mean of log Data	3.766
Median	46.07	SD of log Data	0.395
SD	16.34		
Coefficient of Variation	3.55E-01		
Skewness	0.717		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.54	95% H-UCL	59.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	69.82
95% Adjusted-CLT UCL (Chen-1995)	54.87	97.5% Chebyshev (MVUE) UCL	79.96
95% Modified-t UCL (Johnson-1978)	54.7	99% Chebyshev (MVUE) UCL	99.87

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.016	Data appear Normal at 5% Significance Level	
Theta Star	7.657		
MLE of Mean	46.07		
MLE of Standard Deviation	18.78		
nu star	144.4		
Approximate Chi Square Value (.05)	117.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	53.82
Adjusted Chi Square Value	113.9	95% Jackknife UCL	54.54
		95% Standard Bootstrap UCL	53.4
Anderson-Darling Test Statistic	0.82	95% Bootstrap-t UCL	55.45
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	60.64
Kolmogorov-Smirnov Test Statistic	0.287	95% Percentile Bootstrap UCL	53.79
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	54.67
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.63
		97.5% Chebyshev(Mean, Sd) UCL	75.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	93
95% Approximate Gamma UCL	56.55		
95% Adjusted Gamma UCL	58.38		

Potential UCL to Use		Use 95% Student's-t UCL	54.54

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	7.7	Minimum of Log Data	2.041
Maximum	69.36	Maximum of Log Data	4.239
Mean	51.51	Mean of log Data	3.768
Median	58.25	SD of log Data	0.757
SD	21.04		
Coefficient of Variation	0.409		
Skewness	-1.611		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.715	Shapiro Wilk Test Statistic	0.601
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	62.42	95% H-UCL	102
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	111.9
95% Adjusted-CLT UCL (Chen-1995)	58.48	97.5% Chebyshev (MVUE) UCL	136.1
95% Modified-t UCL (Johnson-1978)	61.95	99% Chebyshev (MVUE) UCL	183.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.338	Data do not follow a Discernable Distribution (0.05)	
Theta Star	22.03		
MLE of Mean	51.51		
MLE of Standard Deviation	33.69		
nu star	56.1		
Approximate Chi Square Value (.05)	39.89	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	61.5
Adjusted Chi Square Value	37.81	95% Jackknife UCL	62.42
		95% Standard Bootstrap UCL	61.13
Anderson-Darling Test Statistic	2.133	95% Bootstrap-t UCL	59.85
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	58.75
Kolmogorov-Smirnov Test Statistic	0.41	95% Percentile Bootstrap UCL	60.47
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	58.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.99
		97.5% Chebyshev(Mean, Sd) UCL	89.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111.9
95% Approximate Gamma UCL	72.45		
95% Adjusted Gamma UCL	76.43		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	77.99
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0187	Minimum of Log Data	-3.979
Maximum	0.159	Maximum of Log Data	-1.841
Mean	0.0887	Mean of log Data	-2.504
Median	0.0887	SD of log Data	0.494
SD	0.0298		
Coefficient of Variation	0.336		
Skewness	8.90E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.511
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.104	95% H-UCL	0.127
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.149
95% Adjusted-CLT UCL (Chen-1995)	0.103	97.5% Chebyshev (MVUE) UCL	0.175
95% Modified-t UCL (Johnson-1978)	0.104	99% Chebyshev (MVUE) UCL	0.224

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.793	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0185		
MLE of Mean	0.0887		
MLE of Standard Deviation	0.0405		
nu star	115		
Approximate Chi Square Value (.05)	91.28	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.103
Adjusted Chi Square Value	88.05	95% Jackknife UCL	0.104
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.867	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.47	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.126
		97.5% Chebyshev(Mean, Sd) UCL	0.142
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.174
95% Approximate Gamma UCL	0.112		
95% Adjusted Gamma UCL	0.116		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.104
	or 95% Modified-t UCL	0.104

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-18.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Aluminum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11800	Minimum of Log Data	9.376
Maximum	19800	Maximum of Log Data	9.893
Mean	15800	Mean of log Data	9.662
Median	15800	SD of log Data	0.111
SD	1706		
Coefficient of Variation	0.108		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.591
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16684	95% H-UCL	16783
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18014
95% Adjusted-CLT UCL (Chen-1995)	16610	97.5% Chebyshev (MVUE) UCL	18971
95% Modified-t UCL (Johnson-1978)	16684	99% Chebyshev (MVUE) UCL	20851

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	68.12	Data do not follow a Discernable Distribution (0.05)	
Theta Star	232		
MLE of Mean	15800		
MLE of Standard Deviation	1914		
nu star	1635		
Approximate Chi Square Value (.05)	1542	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	16610
Adjusted Chi Square Value	1528	95% Jackknife UCL	16684
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.724	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17946
		97.5% Chebyshev(Mean, Sd) UCL	18875
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20699
95% Approximate Gamma UCL	16752		
95% Adjusted Gamma UCL	16903		

Potential UCL to Use		
	Use 95% Student's-t UCL	16684
	or 95% Modified-t UCL	16684

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.49	Minimum of Log Data	-0.713
Maximum	0.66	Maximum of Log Data	-0.416
Mean	0.575	Mean of log Data	-0.555
Median	0.575	SD of log Data	0.0636
SD	0.0362		
Coefficient of Variation	0.063		
Skewness	-5.47E-15		

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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.594	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.621
95% Adjusted-CLT UCL (Chen-1995)	0.592	97.5% Chebyshev (MVUE) UCL		0.641
95% Modified-t UCL (Johnson-1978)	0.594	99% Chebyshev (MVUE) UCL		0.68

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	203.8	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.00282			
MLE of Mean	0.575			
MLE of Standard Deviation	0.0403			
nu star	4892			
Approximate Chi Square Value (.05)	4731	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		0.592
Adjusted Chi Square Value	4707	95% Jackknife UCL		0.594
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.717	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.425	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.621
		97.5% Chebyshev(Mean, Sd) UCL		0.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.679
95% Approximate Gamma UCL	0.595			
95% Adjusted Gamma UCL	0.598			

Potential UCL to Use		
	Use 95% Student's-t UCL	0.594
	or 95% Modified-t UCL	0.594

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	7.29	Minimum of Log Data	1.987
Maximum	16.81	Maximum of Log Data	2.822
Mean	10.39	Mean of log Data	2.309
Median	9.325	SD of log Data	0.256
SD	2.869		
Coefficient of Variation	0.276		
Skewness	1.154		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.87	95% H-UCL	12.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.73
95% Adjusted-CLT UCL (Chen-1995)	12.04	97.5% Chebyshev (MVUE) UCL	15.19
95% Modified-t UCL (Johnson-1978)	11.92	99% Chebyshev (MVUE) UCL	18.05

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.08	Data appear Normal at 5% Significance Level	
Theta Star	0.86		
MLE of Mean	10.39		
MLE of Standard Deviation	2.988		
nu star	289.9		
Approximate Chi Square Value (.05)	251.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.75
Adjusted Chi Square Value	246	95% Jackknife UCL	11.87
		95% Standard Bootstrap UCL	11.7
Anderson-Darling Test Statistic	0.454	95% Bootstrap-t UCL	12.32
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	12.17
Kolmogorov-Smirnov Test Statistic	0.19	95% Percentile Bootstrap UCL	11.78
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	12
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14
		97.5% Chebyshev(Mean, Sd) UCL	15.56
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.63
95% Approximate Gamma UCL	11.97		
95% Adjusted Gamma UCL	12.24		

Potential UCL to Use		Use 95% Student's-t UCL	11.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.69	Minimum of Log Data	-0.371
Maximum	0.74	Maximum of Log Data	-0.301
Mean	0.715	Mean of log Data	-0.336
Median	0.715	SD of log Data	0.0149
SD	0.0107		
Coefficient of Variation	0.0149		
Skewness	3.75E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.721	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.728
95% Adjusted-CLT UCL (Chen-1995)	0.72	97.5% Chebyshev (MVUE) UCL		0.734
95% Modified-t UCL (Johnson-1978)	0.721	99% Chebyshev (MVUE) UCL		0.746

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	3679	Data do not follow a Discernable Distribution (0.05)		
Theta Star	1.94E-04			
MLE of Mean	0.715			
MLE of Standard Deviation	0.0118			
nu star	88290			
Approximate Chi Square Value (.05)	87600	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		0.72
Adjusted Chi Square Value	87495	95% Jackknife UCL		0.721
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.936	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.491	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.728
		97.5% Chebyshev(Mean, Sd) UCL		0.734
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.746
95% Approximate Gamma UCL	0.721			
95% Adjusted Gamma UCL	0.721			

Potential UCL to Use		
	Use 95% Student's-t UCL	0.721
	or 95% Modified-t UCL	0.721

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	35.68	Minimum of Log Data	3.575
Maximum	85	Maximum of Log Data	4.443
Mean	64.56	Mean of log Data	4.121
Median	61.54	SD of log Data	0.325
SD	19.71		
Coefficient of Variation	0.305		
Skewness	-0.0964		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.78	95% H-UCL	78.66
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	91.42
95% Adjusted-CLT UCL (Chen-1995)	73.75	97.5% Chebyshev (MVUE) UCL	103
95% Modified-t UCL (Johnson-1978)	74.75	99% Chebyshev (MVUE) UCL	125.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.253	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.823		
MLE of Mean	64.56		
MLE of Standard Deviation	22.47		
nu star	198.1		
Approximate Chi Square Value (.05)	166.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	73.92
Adjusted Chi Square Value	162.1	95% Jackknife UCL	74.78
		95% Standard Bootstrap UCL	73.63
Anderson-Darling Test Statistic	0.817	95% Bootstrap-t UCL	74.55
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	72.83
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	73.04
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	72.97
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	89.36
		97.5% Chebyshev(Mean, Sd) UCL	100.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	121.2
95% Approximate Gamma UCL	76.8		
95% Adjusted Gamma UCL	78.89		

Potential UCL to Use		
	Use 95% Student's-t UCL	74.78
	or 95% Modified-t UCL	74.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	12361	Minimum of Log Data	9.422
Maximum	30000	Maximum of Log Data	10.31
Mean	18163	Mean of log Data	9.766
Median	17264	SD of log Data	0.295
SD	5552		
Coefficient of Variation	0.306		
Skewness	0.795		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21042	95% H-UCL	21617
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24951
95% Adjusted-CLT UCL (Chen-1995)	21193	97.5% Chebyshev (MVUE) UCL	27894
95% Modified-t UCL (Johnson-1978)	21103	99% Chebyshev (MVUE) UCL	33677

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.379	Data appear Normal at 5% Significance Level	
Theta Star	1937		
MLE of Mean	18163		
MLE of Standard Deviation	5931		
nu star	225.1		
Approximate Chi Square Value (.05)	191.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	20800
Adjusted Chi Square Value	186.6	95% Jackknife UCL	21042
		95% Standard Bootstrap UCL	20704
Anderson-Darling Test Statistic	0.44	95% Bootstrap-t UCL	21748
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	21548
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	20723
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	21054
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	25150
		97.5% Chebyshev(Mean, Sd) UCL	28173
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	34111
95% Approximate Gamma UCL	21365		
95% Adjusted Gamma UCL	21908		

Potential UCL to Use		
	Use 95% Student's-t UCL	21042

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	93.28	Minimum of Log Data	4.536
Maximum	1337	Maximum of Log Data	7.198
Mean	581	Mean of log Data	6.147
Median	491.9	SD of log Data	0.742
SD	369.3		
Coefficient of Variation	0.636		
Skewness	0.761		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.935	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	772.4	95% H-UCL	1072
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1184
95% Adjusted-CLT UCL (Chen-1995)	781.4	97.5% Chebyshev (MVUE) UCL	1437
95% Modified-t UCL (Johnson-1978)	776.3	99% Chebyshev (MVUE) UCL	1934

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.896	Data appear Normal at 5% Significance Level	
Theta Star	306.4		
MLE of Mean	581		
MLE of Standard Deviation	421.9		
nu star	45.5		
Approximate Chi Square Value (.05)	31.03	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	756.3
Adjusted Chi Square Value	29.21	95% Jackknife UCL	772.4
		95% Standard Bootstrap UCL	744.1
Anderson-Darling Test Statistic	0.184	95% Bootstrap-t UCL	797.4
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	791.7
Kolmogorov-Smirnov Test Statistic	0.112	95% Percentile Bootstrap UCL	750.2
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	756.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1046
		97.5% Chebyshev(Mean, Sd) UCL	1247
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1642
95% Approximate Gamma UCL	852		
95% Adjusted Gamma UCL	905		

Potential UCL to Use		Use 95% Student's-t UCL	772.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	14	Minimum of Log Data	2.639
Maximum	105.3	Maximum of Log Data	4.657
Mean	64.15	Mean of log Data	4.033
Median	65	SD of log Data	0.606
SD	26.87		
Coefficient of Variation	0.419		
Skewness	-0.457		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	78.08	95% H-UCL	102.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	119.2
95% Adjusted-CLT UCL (Chen-1995)	75.82	97.5% Chebyshev (MVUE) UCL	141.9
95% Modified-t UCL (Johnson-1978)	77.91	99% Chebyshev (MVUE) UCL	186.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.109	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.64		
MLE of Mean	64.15		
MLE of Standard Deviation	36.39		
nu star	74.61		
Approximate Chi Square Value (.05)	55.71	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	76.91
Adjusted Chi Square Value	53.23	95% Jackknife UCL	78.08
		95% Standard Bootstrap UCL	76.45
Anderson-Darling Test Statistic	1.391	95% Bootstrap-t UCL	76.75
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	77.26
Kolmogorov-Smirnov Test Statistic	0.372	95% Percentile Bootstrap UCL	75.79
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	75.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	97.96
		97.5% Chebyshev(Mean, Sd) UCL	112.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	141.3
95% Approximate Gamma UCL	85.91		
95% Adjusted Gamma UCL	89.92		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	97.96

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.2	Minimum of Log Data	-1.609
Maximum	0.37	Maximum of Log Data	-0.994
Mean	0.285	Mean of log Data	-1.263
Median	0.285	SD of log Data	0.132
SD	0.0362		
Coefficient of Variation	0.127		
Skewness	-8.20E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.588
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.304	95% H-UCL	0.306
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.333
95% Adjusted-CLT UCL (Chen-1995)	0.302	97.5% Chebyshev (MVUE) UCL	0.353
95% Modified-t UCL (Johnson-1978)	0.304	99% Chebyshev (MVUE) UCL	0.394

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	48.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00588		
MLE of Mean	0.285		
MLE of Standard Deviation	0.0409		
nu star	1164		
Approximate Chi Square Value (.05)	1085	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.302
Adjusted Chi Square Value	1074	95% Jackknife UCL	0.304
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.728	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.331
		97.5% Chebyshev(Mean, Sd) UCL	0.35
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.389
95% Approximate Gamma UCL	0.306		
95% Adjusted Gamma UCL	0.309		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.304
	or 95% Modified-t UCL	0.304

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	35.8	Minimum of Log Data	3.578
Maximum	41.1	Maximum of Log Data	3.716
Mean	38.45	Mean of log Data	3.649
Median	38.45	SD of log Data	0.0294
SD	1.13		
Coefficient of Variation	0.0294		
Skewness	1.13E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	39.04	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		39.87
95% Adjusted-CLT UCL (Chen-1995)	38.99	97.5% Chebyshev (MVUE) UCL		40.49
95% Modified-t UCL (Johnson-1978)	39.04	99% Chebyshev (MVUE) UCL		41.7

Gamma Distribution Test		Data Distribution
k star (bias corrected)	945.3	Data do not follow a Discernable Distribution (0.05)
Theta Star	0.0407	
MLE of Mean	38.45	
MLE of Standard Deviation	1.251	
nu star	22687	
Approximate Chi Square Value (.05)	22338	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 38.99
Adjusted Chi Square Value	22285	95% Jackknife UCL 39.04
		95% Standard Bootstrap UCL N/A
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL N/A
Kolmogorov-Smirnov Test Statistic	0.418	95% Percentile Bootstrap UCL N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 39.87
		97.5% Chebyshev(Mean, Sd) UCL 40.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 41.7
95% Approximate Gamma UCL	39.05	
95% Adjusted Gamma UCL	39.14	

Potential UCL to Use		
	Use 95% Student's-t UCL	39.04
	or 95% Modified-t UCL	39.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-19.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6	Minimum of Log Data	1.792
Maximum	12	Maximum of Log Data	2.485
Mean	9.01	Mean of log Data	2.178
Median	9.01	SD of log Data	0.213
SD	1.825		
Coefficient of Variation	0.203		
Skewness	-0.156		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.9
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.956	95% H-UCL	10.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.44
95% Adjusted-CLT UCL (Chen-1995)	9.851	97.5% Chebyshev (MVUE) UCL	12.49
95% Modified-t UCL (Johnson-1978)	9.952	99% Chebyshev (MVUE) UCL	14.55

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.93	Data appear Normal at 5% Significance Level	
Theta Star	0.476		
MLE of Mean	9.01		
MLE of Standard Deviation	2.071		
nu star	454.4		
Approximate Chi Square Value (.05)	406	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.877
Adjusted Chi Square Value	399	95% Jackknife UCL	9.956
		95% Standard Bootstrap UCL	9.843
Anderson-Darling Test Statistic	0.635	95% Bootstrap-t UCL	9.956
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	9.924
Kolmogorov-Smirnov Test Statistic	0.277	95% Percentile Bootstrap UCL	9.813
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	9.8
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.31
		97.5% Chebyshev(Mean, Sd) UCL	12.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.25
95% Approximate Gamma UCL	10.08		
95% Adjusted Gamma UCL	10.26		

Potential UCL to Use		Use 95% Student's-t UCL	9.956

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	13.6	Minimum of Log Data	2.61
Maximum	85	Maximum of Log Data	4.443
Mean	48.78	Mean of log Data	3.801
Median	48.56	SD of log Data	0.465
SD	19.7		
Coefficient of Variation	0.404		
Skewness	0.669		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.814
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	58.99	95% H-UCL	66.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	78.9
95% Adjusted-CLT UCL (Chen-1995)	59.3	97.5% Chebyshev (MVUE) UCL	91.68
95% Modified-t UCL (Johnson-1978)	59.17	99% Chebyshev (MVUE) UCL	116.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.536	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.75		
MLE of Mean	48.78		
MLE of Standard Deviation	22.9		
nu star	108.9		
Approximate Chi Square Value (.05)	85.79	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	58.13
Adjusted Chi Square Value	82.67	95% Jackknife UCL	58.99
		95% Standard Bootstrap UCL	57.83
Anderson-Darling Test Statistic	0.92	95% Bootstrap-t UCL	63.71
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	76.7
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	57.93
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	59.67
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.56
		97.5% Chebyshev(Mean, Sd) UCL	84.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105.4
95% Approximate Gamma UCL	61.9		
95% Adjusted Gamma UCL	64.24		

Potential UCL to Use		
	Use 95% Student's-t UCL	58.99
	or 95% Modified-t UCL	59.17

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	58.38	Minimum of Log Data	4.067
Maximum	78.79	Maximum of Log Data	4.367
Mean	65.9	Mean of log Data	4.186
Median	65	SD of log Data	0.0658
SD	4.548		
Coefficient of Variation	0.069		
Skewness	1.988		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.623	Shapiro Wilk Test Statistic	0.645
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.25	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.35
95% Adjusted-CLT UCL (Chen-1995)	68.86	97.5% Chebyshev (MVUE) UCL	73.72
95% Modified-t UCL (Johnson-1978)	68.38	99% Chebyshev (MVUE) UCL	78.36

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	183.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.359		
MLE of Mean	65.9		
MLE of Standard Deviation	4.867		
nu star	4400		
Approximate Chi Square Value (.05)	4247	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	68.06
Adjusted Chi Square Value	4224	95% Jackknife UCL	68.25
		95% Standard Bootstrap UCL	67.99
Anderson-Darling Test Statistic	2.198	95% Bootstrap-t UCL	72.05
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	80.25
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	68.27
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	68.75
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	71.62
		97.5% Chebyshev(Mean, Sd) UCL	74.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	78.96
95% Approximate Gamma UCL	68.27		
95% Adjusted Gamma UCL	68.64		

Potential UCL to Use		
	Use 95% Student's-t UCL	68.25
	or 95% Modified-t UCL	68.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	10	Maximum of Log Data	2.303
Mean	7.439	Mean of log Data	1.265
Median	8.44	SD of log Data	2.137
SD	3.648		
Coefficient of Variation	0.49		
Skewness	-1.616		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.693	Shapiro Wilk Test Statistic	0.517
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.33	95% H-UCL	1032
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.92
95% Adjusted-CLT UCL (Chen-1995)	8.646	97.5% Chebyshev (MVUE) UCL	114.9
95% Modified-t UCL (Johnson-1978)	9.249	99% Chebyshev (MVUE) UCL	169.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.656	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.34		
MLE of Mean	7.439		
MLE of Standard Deviation	9.186		
nu star	15.74		
Approximate Chi Square Value (.05)	7.78	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.171
Adjusted Chi Square Value	6.942	95% Jackknife UCL	9.33
		95% Standard Bootstrap UCL	9.116
Anderson-Darling Test Statistic	2.919	95% Bootstrap-t UCL	8.881
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	8.7
Kolmogorov-Smirnov Test Statistic	0.48	95% Percentile Bootstrap UCL	9.053
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	8.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.03
		97.5% Chebyshev(Mean, Sd) UCL	14.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.92
95% Approximate Gamma UCL	15.05		
95% Adjusted Gamma UCL	16.87		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.92
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-20.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	6.02	Minimum of Log Data	1.795
Maximum	16.4	Maximum of Log Data	2.797
Mean	9.765	Mean of log Data	2.23
Median	10.08	SD of log Data	0.327
SD	3.233		
Coefficient of Variation	0.331		
Skewness	0.621		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.44	95% H-UCL	11.89
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.82
95% Adjusted-CLT UCL (Chen-1995)	11.48	97.5% Chebyshev (MVUE) UCL	15.58
95% Modified-t UCL (Johnson-1978)	11.47	99% Chebyshev (MVUE) UCL	19.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.786	Data appear Normal at 5% Significance Level	
Theta Star	1.254		
MLE of Mean	9.765		
MLE of Standard Deviation	3.499		
nu star	186.9		
Approximate Chi Square Value (.05)	156.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.3
Adjusted Chi Square Value	152	95% Jackknife UCL	11.44
		95% Standard Bootstrap UCL	11.19
Anderson-Darling Test Statistic	0.55	95% Bootstrap-t UCL	11.72
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	11.56
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	11.29
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.35
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.83
		97.5% Chebyshev(Mean, Sd) UCL	15.59
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.05
95% Approximate Gamma UCL	11.68		
95% Adjusted Gamma UCL	12.01		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	93.5	Minimum of Log Data	4.538
Maximum	326	Maximum of Log Data	5.787
Mean	209.8	Mean of log Data	5.315
Median	209.8	SD of log Data	0.276
SD	49.57		
Coefficient of Variation	0.236		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.559
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	235.4	95% H-UCL	247.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	284.3
95% Adjusted-CLT UCL (Chen-1995)	233.3	97.5% Chebyshev (MVUE) UCL	316.1
95% Modified-t UCL (Johnson-1978)	235.4	99% Chebyshev (MVUE) UCL	378.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.44	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.86		
MLE of Mean	209.8		
MLE of Standard Deviation	59.47		
nu star	298.6		
Approximate Chi Square Value (.05)	259.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	233.3
Adjusted Chi Square Value	254	95% Jackknife UCL	235.4
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.771	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	272.1
		97.5% Chebyshev(Mean, Sd) UCL	299.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	352.1
95% Approximate Gamma UCL	241.3		
95% Adjusted Gamma UCL	246.6		

Potential UCL to Use		
	Use 95% Student's-t UCL	235.4
	or 95% Modified-t UCL	235.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.5	Minimum of Log Data	-0.693
Maximum	1.1	Maximum of Log Data	0.0953
Mean	0.8	Mean of log Data	-0.236
Median	0.8	SD of log Data	0.171
SD	0.128		
Coefficient of Variation	0.16		
Skewness	-3.07E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.582
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.866	95% H-UCL	0.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.973
95% Adjusted-CLT UCL (Chen-1995)	0.861	97.5% Chebyshev (MVUE) UCL	1.048
95% Modified-t UCL (Johnson-1978)	0.866	99% Chebyshev (MVUE) UCL	1.194

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	29.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0268		
MLE of Mean	0.8		
MLE of Standard Deviation	0.146		
nu star	717		
Approximate Chi Square Value (.05)	655.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.861
Adjusted Chi Square Value	646.9	95% Jackknife UCL	0.866
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.737	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.961
		97.5% Chebyshev(Mean, Sd) UCL	1.031
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.167
95% Approximate Gamma UCL	0.875		
95% Adjusted Gamma UCL	0.887		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.866
	or 95% Modified-t UCL	0.866

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	11.3	Minimum of Log Data	2.425
Maximum	103	Maximum of Log Data	4.635
Mean	57.21	Mean of log Data	3.915
Median	50.29	SD of log Data	0.593
SD	26.77		
Coefficient of Variation	0.468		
Skewness	0.212		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.873
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.09	95% H-UCL	89.66
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.2
95% Adjusted-CLT UCL (Chen-1995)	70.43	97.5% Chebyshev (MVUE) UCL	123.8
95% Modified-t UCL (Johnson-1978)	71.17	99% Chebyshev (MVUE) UCL	162.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.031	Data appear Normal at 5% Significance Level	
Theta Star	18.87		
MLE of Mean	57.21		
MLE of Standard Deviation	32.86		
nu star	72.75		
Approximate Chi Square Value (.05)	54.11	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.92
Adjusted Chi Square Value	51.66	95% Jackknife UCL	71.09
		95% Standard Bootstrap UCL	69.17
Anderson-Darling Test Statistic	0.437	95% Bootstrap-t UCL	73.13
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	70.14
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	69.73
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	69.68
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	90.89
		97.5% Chebyshev(Mean, Sd) UCL	105.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.1
95% Approximate Gamma UCL	76.92		
95% Adjusted Gamma UCL	80.56		

Potential UCL to Use		Use 95% Student's-t UCL	71.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	21.1	Maximum of Log Data	3.049
Mean	13.05	Mean of log Data	2.529
Median	13.05	SD of log Data	0.321
SD	3.433		
Coefficient of Variation	0.263		
Skewness	-1.84E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.549
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.83	95% H-UCL	15.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.5
95% Adjusted-CLT UCL (Chen-1995)	14.68	97.5% Chebyshev (MVUE) UCL	20.82
95% Modified-t UCL (Johnson-1978)	14.83	99% Chebyshev (MVUE) UCL	25.38

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.576	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.363		
MLE of Mean	13.05		
MLE of Standard Deviation	4.217		
nu star	229.8		
Approximate Chi Square Value (.05)	195.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	14.68
Adjusted Chi Square Value	190.9	95% Jackknife UCL	14.83
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.788	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.454	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.37
		97.5% Chebyshev(Mean, Sd) UCL	19.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.91
95% Approximate Gamma UCL	15.32		
95% Adjusted Gamma UCL	15.71		

Potential UCL to Use		
	Use 95% Student's-t UCL	14.83
	or 95% Modified-t UCL	14.83

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	301.9	Minimum of Log Data	5.71
Maximum	4670	Maximum of Log Data	8.449
Mean	784.6	Mean of log Data	6.243
Median	435.6	SD of log Data	0.73
SD	1227		
Coefficient of Variation	1.564		
Skewness	3.428		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.397	Shapiro Wilk Test Statistic	0.618
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1421	95% H-UCL	1153
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1281
95% Adjusted-CLT UCL (Chen-1995)	1742	97.5% Chebyshev (MVUE) UCL	1552
95% Modified-t UCL (Johnson-1978)	1479	99% Chebyshev (MVUE) UCL	2085

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.05	Data do not follow a Discernable Distribution (0.05)	
Theta Star	747		
MLE of Mean	784.6		
MLE of Standard Deviation	765.6		
nu star	25.21		
Approximate Chi Square Value (.05)	14.77	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1367
Adjusted Chi Square Value	13.57	95% Jackknife UCL	1421
		95% Standard Bootstrap UCL	1344
Anderson-Darling Test Statistic	2.514	95% Bootstrap-t UCL	6318
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	4832
Kolmogorov-Smirnov Test Statistic	0.446	95% Percentile Bootstrap UCL	1489
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	1852
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2329
		97.5% Chebyshev(Mean, Sd) UCL	2997
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4309
95% Approximate Gamma UCL	1339		
95% Adjusted Gamma UCL	1458		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2329

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0187	Minimum of Log Data	-3.979
Maximum	10	Maximum of Log Data	2.303
Mean	8.111	Mean of log Data	1.268
Median	10	SD of log Data	2.346
SD	3.856		
Coefficient of Variation	0.475		
Skewness	-1.897		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.542	Shapiro Wilk Test Statistic	0.49
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.11	95% H-UCL	3191
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	128.6
95% Adjusted-CLT UCL (Chen-1995)	9.29	97.5% Chebyshev (MVUE) UCL	170.7
95% Modified-t UCL (Johnson-1978)	10.01	99% Chebyshev (MVUE) UCL	253.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.602	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.48		
MLE of Mean	8.111		
MLE of Standard Deviation	10.46		
nu star	14.44		
Approximate Chi Square Value (.05)	6.876	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.942
Adjusted Chi Square Value	6.096	95% Jackknife UCL	10.11
		95% Standard Bootstrap UCL	9.752
Anderson-Darling Test Statistic	3.482	95% Bootstrap-t UCL	9.445
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	9.435
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	9.547
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	9.168
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.96
		97.5% Chebyshev(Mean, Sd) UCL	15.06
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.19
95% Approximate Gamma UCL	17.04		
95% Adjusted Gamma UCL	19.22		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.19
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	8.3	Minimum of Log Data	2.116
Maximum	65.7	Maximum of Log Data	4.185
Mean	56.23	Mean of log Data	3.886
Median	65	SD of log Data	0.69
SD	20.7		
Coefficient of Variation	0.368		
Skewness	-2.082		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.484	Shapiro Wilk Test Statistic	0.491
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.97	95% H-UCL	101.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	115
95% Adjusted-CLT UCL (Chen-1995)	62.22	97.5% Chebyshev (MVUE) UCL	138.6
95% Modified-t UCL (Johnson-1978)	66.37	99% Chebyshev (MVUE) UCL	185

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.786	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.19		
MLE of Mean	56.23		
MLE of Standard Deviation	33.69		
nu star	66.85		
Approximate Chi Square Value (.05)	49.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	66.06
Adjusted Chi Square Value	46.72	95% Jackknife UCL	66.97
		95% Standard Bootstrap UCL	65.05
Anderson-Darling Test Statistic	3.296	95% Bootstrap-t UCL	63.69
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	62.48
Kolmogorov-Smirnov Test Statistic	0.509	95% Percentile Bootstrap UCL	65.06
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	61.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.28
		97.5% Chebyshev(Mean, Sd) UCL	93.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	115.7
95% Approximate Gamma UCL	76.66		
95% Adjusted Gamma UCL	80.48		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	82.28

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	12.22	Maximum of Log Data	2.503
Mean	10.38	Mean of log Data	2.338
Median	10	SD of log Data	0.0677
SD	0.739		
Coefficient of Variation	0.0712		
Skewness	1.855		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.602
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.76	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.26
95% Adjusted-CLT UCL (Chen-1995)	10.85	97.5% Chebyshev (MVUE) UCL	11.65
95% Modified-t UCL (Johnson-1978)	10.78	99% Chebyshev (MVUE) UCL	12.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	172.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.06		
MLE of Mean	10.38		
MLE of Standard Deviation	0.789		
nu star	4150		
Approximate Chi Square Value (.05)	4001	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.73
Adjusted Chi Square Value	3979	95% Jackknife UCL	10.76
		95% Standard Bootstrap UCL	10.7
Anderson-Darling Test Statistic	2.433	95% Bootstrap-t UCL	11.13
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.65
Kolmogorov-Smirnov Test Statistic	0.456	95% Percentile Bootstrap UCL	10.75
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.79
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.31
		97.5% Chebyshev(Mean, Sd) UCL	11.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.5
95% Approximate Gamma UCL	10.77		
95% Adjusted Gamma UCL	10.83		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.76
	or 95% Modified-t UCL	10.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0048	Minimum of Log Data	-5.339
Maximum	0.031	Maximum of Log Data	-3.474
Mean	0.0179	Mean of log Data	-4.087
Median	0.0179	SD of log Data	0.425
SD	0.00559		
Coefficient of Variation	0.312		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.525
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0208	95% H-UCL	0.0239
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0281
95% Adjusted-CLT UCL (Chen-1995)	0.0206	97.5% Chebyshev (MVUE) UCL	0.0324
95% Modified-t UCL (Johnson-1978)	0.0208	99% Chebyshev (MVUE) UCL	0.0409

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.045	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00296		
MLE of Mean	0.0179		
MLE of Standard Deviation	0.00728		
nu star	145.1		
Approximate Chi Square Value (.05)	118.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.0206
Adjusted Chi Square Value	114.5	95% Jackknife UCL	0.0208
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.834	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0249
		97.5% Chebyshev(Mean, Sd) UCL	0.028
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0339
95% Approximate Gamma UCL	0.022		
95% Adjusted Gamma UCL	0.0227		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0208
	or 95% Modified-t UCL	0.0208

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	24.7	Minimum of Log Data	3.207
Maximum	38.1	Maximum of Log Data	3.64
Mean	31.4	Mean of log Data	3.443
Median	31.4	SD of log Data	0.0928
SD	2.857		
Coefficient of Variation	0.091		
Skewness	6.92E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.594
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	32.88	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		35.07
95% Adjusted-CLT UCL (Chen-1995)	32.76	97.5% Chebyshev (MVUE) UCL		36.66
95% Modified-t UCL (Johnson-1978)	32.88	99% Chebyshev (MVUE) UCL		39.78

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	96.75	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.325			
MLE of Mean	31.4			
MLE of Standard Deviation	3.192			
nu star	2322			
Approximate Chi Square Value (.05)	2211	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		32.76
Adjusted Chi Square Value	2195	95% Jackknife UCL		32.88
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.721	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.428	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		34.99
		97.5% Chebyshev(Mean, Sd) UCL		36.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		39.61
95% Approximate Gamma UCL	32.98			
95% Adjusted Gamma UCL	33.22			

Potential UCL to Use		
	Use 95% Student's-t UCL	32.88
	or 95% Modified-t UCL	32.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-22.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	8480	Minimum of Log Data	9.045
Maximum	13300	Maximum of Log Data	9.496
Mean	10760	Mean of log Data	9.279
Median	10760	SD of log Data	0.0963
SD	1032		
Coefficient of Variation	0.0959		
Skewness	0.448		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.634	Shapiro Wilk Test Statistic	0.635
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11295	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12065
95% Adjusted-CLT UCL (Chen-1995)	11291	97.5% Chebyshev (MVUE) UCL	12630
95% Modified-t UCL (Johnson-1978)	11301	99% Chebyshev (MVUE) UCL	13739

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	89.01	Data do not follow a Discernable Distribution (0.05)	
Theta Star	120.9		
MLE of Mean	10760		
MLE of Standard Deviation	1140		
nu star	2136		
Approximate Chi Square Value (.05)	2030	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11250
Adjusted Chi Square Value	2014	95% Jackknife UCL	11295
		95% Standard Bootstrap UCL	11238
Anderson-Darling Test Statistic	2.434	95% Bootstrap-t UCL	11261
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11565
Kolmogorov-Smirnov Test Statistic	0.404	95% Percentile Bootstrap UCL	11183
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11205
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12059
		97.5% Chebyshev(Mean, Sd) UCL	12621
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13724
95% Approximate Gamma UCL	11324		
95% Adjusted Gamma UCL	11413		
Potential UCL to Use		Use 95% Student's-t UCL	11295
		or 95% Modified-t UCL	11301

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.38	Minimum of Log Data	-0.968
Maximum	0.66	Maximum of Log Data	-0.416
Mean	0.497	Mean of log Data	-0.707
Median	0.497	SD of log Data	0.121
SD	0.0621		
Coefficient of Variation	0.125		
Skewness	1.213		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.671	Shapiro Wilk Test Statistic	0.694
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.529	95% H-UCL	0.53
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.572
95% Adjusted-CLT UCL (Chen-1995)	0.533	97.5% Chebyshev (MVUE) UCL	0.605
95% Modified-t UCL (Johnson-1978)	0.53	99% Chebyshev (MVUE) UCL	0.67

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	54.99	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.009		
MLE of Mean	0.497		
MLE of Standard Deviation	0.067		
nu star	1320		
Approximate Chi Square Value (.05)	1236	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.526
Adjusted Chi Square Value	1224	95% Jackknife UCL	0.529
		95% Standard Bootstrap UCL	0.525
Anderson-Darling Test Statistic	2.077	95% Bootstrap-t UCL	0.531
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	0.577
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	0.526
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.53
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.575
		97.5% Chebyshev(Mean, Sd) UCL	0.609
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.675
95% Approximate Gamma UCL	0.53		
95% Adjusted Gamma UCL	0.535		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.529
	or 95% Modified-t UCL	0.53

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	8.84	Minimum of Log Data	2.179
Maximum	13.73	Maximum of Log Data	2.62
Mean	10.91	Mean of log Data	2.385
Median	10.91	SD of log Data	0.102
SD	1.141		
Coefficient of Variation	0.105		
Skewness	0.953		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.868	Shapiro Wilk Test Statistic	0.89
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.5	95% H-UCL	11.53
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.31
95% Adjusted-CLT UCL (Chen-1995)	11.55	97.5% Chebyshev (MVUE) UCL	12.92
95% Modified-t UCL (Johnson-1978)	11.52	99% Chebyshev (MVUE) UCL	14.11

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	77.51	Data appear Normal at 5% Significance Level	
Theta Star	0.141		
MLE of Mean	10.91		
MLE of Standard Deviation	1.239		
nu star	1860		
Approximate Chi Square Value (.05)	1761	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.45
Adjusted Chi Square Value	1746	95% Jackknife UCL	11.5
		95% Standard Bootstrap UCL	11.43
Anderson-Darling Test Statistic	0.744	95% Bootstrap-t UCL	11.6
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	12.18
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	11.44
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.51
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.34
		97.5% Chebyshev(Mean, Sd) UCL	12.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.19
95% Approximate Gamma UCL	11.52		
95% Adjusted Gamma UCL	11.62		

Potential UCL to Use		Use 95% Student's-t UCL	11.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics
Minimum	-0.039	Log Statistics Not Avaliable
Maximum	0.288	
Mean	0.0625	
Median	0.0625	
SD	0.0791	
Coefficient of Variation	1.265	
Skewness	2.191	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.667	Not Available
Shapiro Wilk Critical Value	0.859	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.104	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.104	95% Adjusted-CLT UCL (Chen 1995)		0.116
		95% Modified-t UCL (Johnson-1978)		0.106

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.162	95% CLT UCL	0.1
		95% Jackknife UCL	0.104
		95% Standard Bootstrap UCL	0.098
		95% Bootstrap-t UCL	0.124
		95% Hall's Bootstrap UCL	0.283
		95% Percentile Bootstrap UCL	0.1
		95% BCA Bootstrap UCL	0.117
		95% Chebyshev(Mean, Sd) UCL	0.162
		97.5% Chebyshev(Mean, Sd) UCL	0.205
		99% Chebyshev(Mean, Sd) UCL	0.29

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	35.51	Minimum of Log Data	3.57
Maximum	55.27	Maximum of Log Data	4.012
Mean	44.79	Mean of log Data	3.795
Median	44.79	SD of log Data	0.118
SD	5.31		
Coefficient of Variation	0.119		
Skewness	0.365		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	47.54	95% H-UCL	47.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.46
95% Adjusted-CLT UCL (Chen-1995)	47.48	97.5% Chebyshev (MVUE) UCL	54.34
95% Modified-t UCL (Johnson-1978)	47.57	99% Chebyshev (MVUE) UCL	60.01

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	58.74	Data appear Normal at 5% Significance Level	
Theta Star	0.763		
MLE of Mean	44.79		
MLE of Standard Deviation	5.844		
nu star	1410		
Approximate Chi Square Value (.05)	1323	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	47.31
Adjusted Chi Square Value	1311	95% Jackknife UCL	47.54
		95% Standard Bootstrap UCL	47.19
Anderson-Darling Test Statistic	0.396	95% Bootstrap-t UCL	48.08
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	48.23
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	47.22
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	47.35
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	51.47
		97.5% Chebyshev(Mean, Sd) UCL	54.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	60.04
95% Approximate Gamma UCL	47.7		
95% Adjusted Gamma UCL	48.17		

Potential UCL to Use		Use 95% Student's-t UCL	47.54

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	4.9	Minimum of Log Data	1.589
Maximum	13.9	Maximum of Log Data	2.632
Mean	9.767	Mean of log Data	2.257
Median	9.767	SD of log Data	0.233
SD	1.938		
Coefficient of Variation	0.198		
Skewness	-0.663		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.647	Shapiro Wilk Test Statistic	0.59
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.77	95% H-UCL	11.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.69
95% Adjusted-CLT UCL (Chen-1995)	10.57	97.5% Chebyshev (MVUE) UCL	13.94
95% Modified-t UCL (Johnson-1978)	10.75	99% Chebyshev (MVUE) UCL	16.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.568		
MLE of Mean	9.767		
MLE of Standard Deviation	2.355		
nu star	412.7		
Approximate Chi Square Value (.05)	366.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.69
Adjusted Chi Square Value	360	95% Jackknife UCL	10.77
		95% Standard Bootstrap UCL	10.69
Anderson-Darling Test Statistic	2.453	95% Bootstrap-t UCL	10.6
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	10.78
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	10.58
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.21
		97.5% Chebyshev(Mean, Sd) UCL	13.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.33
95% Approximate Gamma UCL	10.99		
95% Adjusted Gamma UCL	11.2		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.77
	or 95% Modified-t UCL	10.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	162.1	Minimum of Log Data	5.088
Maximum	1700	Maximum of Log Data	7.438
Mean	758	Mean of log Data	6.464
Median	752.3	SD of log Data	0.635
SD	445.1		
Coefficient of Variation	0.587		
Skewness	1.127		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.851	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	988.8	95% H-UCL	1225
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1408
95% Adjusted-CLT UCL (Chen-1995)	1014	97.5% Chebyshev (MVUE) UCL	1684
95% Modified-t UCL (Johnson-1978)	995.7	99% Chebyshev (MVUE) UCL	2226

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.425	Data Follow Appr. Gamma Distribution at 5% Significance Lev	
Theta Star	312.5		
MLE of Mean	758		
MLE of Standard Deviation	486.7		
nu star	58.21		
Approximate Chi Square Value (.05)	41.67	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	969.4
Adjusted Chi Square Value	39.54	95% Jackknife UCL	988.8
		95% Standard Bootstrap UCL	961.9
Anderson-Darling Test Statistic	0.582	95% Bootstrap-t UCL	1127
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	2601
Kolmogorov-Smirnov Test Statistic	0.258	95% Percentile Bootstrap UCL	968.4
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	993
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1318
		97.5% Chebyshev(Mean, Sd) UCL	1560
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2036
95% Approximate Gamma UCL	1059		
95% Adjusted Gamma UCL	1116		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1059

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	8.9	Minimum of Log Data	2.186
Maximum	70.76	Maximum of Log Data	4.259
Mean	46.65	Mean of log Data	3.677
Median	46.65	SD of log Data	0.69
SD	21.65		
Coefficient of Variation	0.464		
Skewness	-0.75		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.87	95% H-UCL	82.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.27
95% Adjusted-CLT UCL (Chen-1995)	55.48	97.5% Chebyshev (MVUE) UCL	112.4
95% Modified-t UCL (Johnson-1978)	57.64	99% Chebyshev (MVUE) UCL	150.1

Gamma Distribution Test		Data Distribution
k star (bias corrected)	2.437	Data do not follow a Discernable Distribution (0.05)
Theta Star	19.14	
MLE of Mean	46.65	
MLE of Standard Deviation	29.88	
nu star	58.48	
Approximate Chi Square Value (.05)	41.9	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 56.93
Adjusted Chi Square Value	39.76	95% Jackknife UCL 57.87
		95% Standard Bootstrap UCL 56.53
Anderson-Darling Test Statistic	1.139	95% Bootstrap-t UCL 56.93
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL 54.82
Kolmogorov-Smirnov Test Statistic	0.325	95% Percentile Bootstrap UCL 55.82
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL 55.57
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 73.89
		97.5% Chebyshev(Mean, Sd) UCL 85.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 108.8
95% Approximate Gamma UCL	65.1	
95% Adjusted Gamma UCL	68.6	

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	73.89
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.35	Minimum of Log Data	-1.05
Maximum	18	Maximum of Log Data	2.89
Mean	4.385	Mean of log Data	0.812
Median	4.385	SD of log Data	1.394
SD	4.781		
Coefficient of Variation	1.09		
Skewness	2.261		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.68	Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.864	95% H-UCL	27.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.2
95% Adjusted-CLT UCL (Chen-1995)	7.618	97.5% Chebyshev (MVUE) UCL	19.52
95% Modified-t UCL (Johnson-1978)	7.014	99% Chebyshev (MVUE) UCL	28.01

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.716	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.126		
MLE of Mean	4.385		
MLE of Standard Deviation	5.183		
nu star	17.18		
Approximate Chi Square Value (.05)	8.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.656
Adjusted Chi Square Value	7.901	95% Jackknife UCL	6.864
		95% Standard Bootstrap UCL	6.495
Anderson-Darling Test Statistic	1.23	95% Bootstrap-t UCL	8.499
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	16.86
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	6.939
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	7.477
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.4
		97.5% Chebyshev(Mean, Sd) UCL	13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.12
95% Approximate Gamma UCL	8.56		
95% Adjusted Gamma UCL	9.535		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	10.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.028	Minimum of Log Data	-3.576
Maximum	11.35	Maximum of Log Data	2.429
Mean	6.437	Mean of log Data	0.808
Median	6.437	SD of log Data	2.398
SD	4.235		
Coefficient of Variation	0.658		
Skewness	-0.693		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.822	Shapiro Wilk Test Statistic	0.647
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.633	95% H-UCL	2708
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.53
95% Adjusted-CLT UCL (Chen-1995)	8.187	97.5% Chebyshev (MVUE) UCL	119
95% Modified-t UCL (Johnson-1978)	8.592	99% Chebyshev (MVUE) UCL	176.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.496	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.97		
MLE of Mean	6.437		
MLE of Standard Deviation	9.136		
nu star	11.92		
Approximate Chi Square Value (.05)	5.171	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	8.448
Adjusted Chi Square Value	4.512	95% Jackknife UCL	8.633
		95% Standard Bootstrap UCL	8.372
Anderson-Darling Test Statistic	2.046	95% Bootstrap-t UCL	8.229
Anderson-Darling 5% Critical Value	0.778	95% Hall's Bootstrap UCL	8.181
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	8.38
Kolmogorov-Smirnov 5% Critical Value	0.257	95% BCA Bootstrap UCL	8.099
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.77
		97.5% Chebyshev(Mean, Sd) UCL	14.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.6
95% Approximate Gamma UCL	14.83		
95% Adjusted Gamma UCL	17		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.6
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-23.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	5.82	Minimum of Log Data	1.761
Maximum	18.03	Maximum of Log Data	2.892
Mean	9.494	Mean of log Data	2.207
Median	8.96	SD of log Data	0.298
SD	3.186		
Coefficient of Variation	0.336		
Skewness	1.799		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.836	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.15	95% H-UCL	11.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.05
95% Adjusted-CLT UCL (Chen-1995)	11.52	97.5% Chebyshev (MVUE) UCL	14.6
95% Modified-t UCL (Johnson-1978)	11.22	99% Chebyshev (MVUE) UCL	17.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.81	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.078		
MLE of Mean	9.494		
MLE of Standard Deviation	3.198		
nu star	211.4		
Approximate Chi Square Value (.05)	178.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.01
Adjusted Chi Square Value	174.2	95% Jackknife UCL	11.15
		95% Standard Bootstrap UCL	10.96
Anderson-Darling Test Statistic	0.386	95% Bootstrap-t UCL	11.95
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	18.61
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	11.05
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.56
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.5
		97.5% Chebyshev(Mean, Sd) UCL	15.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.64
95% Approximate Gamma UCL	11.23		
95% Adjusted Gamma UCL	11.52		
Potential UCL to Use		Use 95% Approximate Gamma UCL	11.23

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.053	Minimum of Log Data	-2.937
Maximum	8.55	Maximum of Log Data	2.146
Mean	4.302	Mean of log Data	1.15
Median	4.302	SD of log Data	1.302
SD	1.812		
Coefficient of Variation	0.421		
Skewness	-2.61E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.415
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.241	95% H-UCL	29.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.36
95% Adjusted-CLT UCL (Chen-1995)	5.162	97.5% Chebyshev (MVUE) UCL	23.45
95% Modified-t UCL (Johnson-1978)	5.241	99% Chebyshev (MVUE) UCL	33.46

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.38	Data do not follow a Discernable Distribution (0.05)		
Theta Star	3.117			
MLE of Mean	4.302			
MLE of Standard Deviation	3.662			
nu star	33.12			
Approximate Chi Square Value (.05)	20.96	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		5.162
Adjusted Chi Square Value	19.5	95% Jackknife UCL		5.241
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.274	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.517	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		6.581
		97.5% Chebyshev(Mean, Sd) UCL		7.567
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		9.505
95% Approximate Gamma UCL	6.796			
95% Adjusted Gamma UCL	7.307			

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.581

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cesium-137 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	35.05	Minimum of Log Data	3.557
Maximum	85	Maximum of Log Data	4.443
Mean	51.14	Mean of log Data	3.898
Median	45.75	SD of log Data	0.274
SD	15.12		
Coefficient of Variation	0.296		
Skewness	1.135		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	58.98	95% H-UCL	59.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	68.79
95% Adjusted-CLT UCL (Chen-1995)	59.85	97.5% Chebyshev (MVUE) UCL	76.47
95% Modified-t UCL (Johnson-1978)	59.21	99% Chebyshev (MVUE) UCL	91.56

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.56	Data appear Normal at 5% Significance Level	
Theta Star	4.844		
MLE of Mean	51.14		
MLE of Standard Deviation	15.74		
nu star	253.3		
Approximate Chi Square Value (.05)	217.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	58.32
Adjusted Chi Square Value	212.4	95% Jackknife UCL	58.98
		95% Standard Bootstrap UCL	57.97
Anderson-Darling Test Statistic	0.398	95% Bootstrap-t UCL	61.86
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	59.88
Kolmogorov-Smirnov Test Statistic	0.172	95% Percentile Bootstrap UCL	58.31
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	59.76
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.17
		97.5% Chebyshev(Mean, Sd) UCL	78.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	94.58
95% Approximate Gamma UCL	59.57		
95% Adjusted Gamma UCL	60.99		

Potential UCL to Use		Use 95% Student's-t UCL	58.98

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	12358	Minimum of Log Data	9.422
Maximum	33875	Maximum of Log Data	10.43
Mean	16380	Mean of log Data	9.665
Median	15079	SD of log Data	0.267
SD	5762		
Coefficient of Variation	0.352		
Skewness	2.941		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.604	Shapiro Wilk Test Statistic	0.733
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19367	95% H-UCL	19022
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21789
95% Adjusted-CLT UCL (Chen-1995)	20625	97.5% Chebyshev (MVUE) UCL	24175
95% Modified-t UCL (Johnson-1978)	19602	99% Chebyshev (MVUE) UCL	28862

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.761	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1678		
MLE of Mean	16380		
MLE of Standard Deviation	5243		
nu star	234.3		
Approximate Chi Square Value (.05)	199.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	19116
Adjusted Chi Square Value	195	95% Jackknife UCL	19367
		95% Standard Bootstrap UCL	19069
Anderson-Darling Test Statistic	1.335	95% Bootstrap-t UCL	23798
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	29898
Kolmogorov-Smirnov Test Statistic	0.333	95% Percentile Bootstrap UCL	19411
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	21309
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23630
		97.5% Chebyshev(Mean, Sd) UCL	26767
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32930
95% Approximate Gamma UCL	19202		
95% Adjusted Gamma UCL	19680		

Potential UCL to Use		
	Use 95% Student's-t UCL	19367
	or 95% Modified-t UCL	19602

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	287.7	Minimum of Log Data	5.662
Maximum	1302	Maximum of Log Data	7.171
Mean	552.6	Mean of log Data	6.204
Median	425.9	SD of log Data	0.471
SD	297.8		
Coefficient of Variation	0.539		
Skewness	1.582		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	707	95% H-UCL	746.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	879.4
95% Adjusted-CLT UCL (Chen-1995)	736	97.5% Chebyshev (MVUE) UCL	1023
95% Modified-t UCL (Johnson-1978)	713.5	99% Chebyshev (MVUE) UCL	1305

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.577	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	154.5		
MLE of Mean	552.6		
MLE of Standard Deviation	292.2		
nu star	85.85		
Approximate Chi Square Value (.05)	65.49	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	694
Adjusted Chi Square Value	62.78	95% Jackknife UCL	707
		95% Standard Bootstrap UCL	686.1
Anderson-Darling Test Statistic	0.57	95% Bootstrap-t UCL	776.6
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	783
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	693
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	733.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	927.3
		97.5% Chebyshev(Mean, Sd) UCL	1089
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1408
95% Approximate Gamma UCL	724.4		
95% Adjusted Gamma UCL	755.7		

Potential UCL to Use		Use 95% Approximate Gamma UCL	724.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0236	Minimum of Log Data	-3.747
Maximum	10	Maximum of Log Data	2.303
Mean	8.889	Mean of log Data	1.767
Median	10	SD of log Data	1.738
SD	2.876		
Coefficient of Variation	0.324		
Skewness	-3.144		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.46	Shapiro Wilk Test Statistic	0.353
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.38	95% H-UCL	265.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	70.41
95% Adjusted-CLT UCL (Chen-1995)	9.449	97.5% Chebyshev (MVUE) UCL	91.9
95% Modified-t UCL (Johnson-1978)	10.25	99% Chebyshev (MVUE) UCL	134.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.061	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.379		
MLE of Mean	8.889		
MLE of Standard Deviation	8.63		
nu star	25.46		
Approximate Chi Square Value (.05)	14.96	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.25
Adjusted Chi Square Value	13.75	95% Jackknife UCL	10.38
		95% Standard Bootstrap UCL	10.18
Anderson-Darling Test Statistic	3.896	95% Bootstrap-t UCL	9.904
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	9.768
Kolmogorov-Smirnov Test Statistic	0.472	95% Percentile Bootstrap UCL	9.815
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	9.72
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.51
		97.5% Chebyshev(Mean, Sd) UCL	14.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.15
95% Approximate Gamma UCL	15.12		
95% Adjusted Gamma UCL	16.46		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.15
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	54.15	Minimum of Log Data	3.992
Maximum	88.92	Maximum of Log Data	4.488
Mean	68.14	Mean of log Data	4.212
Median	65	SD of log Data	0.138
SD	10.04		
Coefficient of Variation	0.147		
Skewness	1.448		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.728	Shapiro Wilk Test Statistic	0.764
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.34	95% H-UCL	73.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.94
95% Adjusted-CLT UCL (Chen-1995)	74.2	97.5% Chebyshev (MVUE) UCL	85.06
95% Modified-t UCL (Johnson-1978)	73.55	99% Chebyshev (MVUE) UCL	95.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	41.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.644		
MLE of Mean	68.14		
MLE of Standard Deviation	10.58		
nu star	995		
Approximate Chi Square Value (.05)	922.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	72.91
Adjusted Chi Square Value	912.2	95% Jackknife UCL	73.34
		95% Standard Bootstrap UCL	72.8
Anderson-Darling Test Statistic	1.633	95% Bootstrap-t UCL	79.9
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	115
Kolmogorov-Smirnov Test Statistic	0.315	95% Percentile Bootstrap UCL	72.77
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	74.38
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.78
		97.5% Chebyshev(Mean, Sd) UCL	86.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	96.98
95% Approximate Gamma UCL	73.47		
95% Adjusted Gamma UCL	74.33		

Potential UCL to Use		
	Use 95% Student's-t UCL	73.34
	or 95% Modified-t UCL	73.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	9.87	Minimum of Log Data	2.289
Maximum	11.48	Maximum of Log Data	2.441
Mean	10.12	Mean of log Data	2.314
Median	10	SD of log Data	0.0402
SD	0.431		
Coefficient of Variation	0.0426		
Skewness	3.367		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.417	Shapiro Wilk Test Statistic	0.423
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.35	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.63
95% Adjusted-CLT UCL (Chen-1995)	10.46	97.5% Chebyshev (MVUE) UCL	10.86
95% Modified-t UCL (Johnson-1978)	10.37	99% Chebyshev (MVUE) UCL	11.29

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	487.1	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0208		
MLE of Mean	10.12		
MLE of Standard Deviation	0.459		
nu star	11690		
Approximate Chi Square Value (.05)	11439	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.33
Adjusted Chi Square Value	11402	95% Jackknife UCL	10.35
		95% Standard Bootstrap UCL	10.32
Anderson-Darling Test Statistic	3.33	95% Bootstrap-t UCL	11.49
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.82
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	10.37
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.38
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.66
		97.5% Chebyshev(Mean, Sd) UCL	10.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.36
95% Approximate Gamma UCL	10.34		
95% Adjusted Gamma UCL	10.38		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.35
	or 95% Modified-t UCL	10.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-24.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	6.25	Minimum of Log Data	1.833
Maximum	18.79	Maximum of Log Data	2.933
Mean	10.06	Mean of log Data	2.264
Median	9.64	SD of log Data	0.305
SD	3.345		
Coefficient of Variation	0.332		
Skewness	1.565		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.8	95% H-UCL	12.04
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.94
95% Adjusted-CLT UCL (Chen-1995)	12.12	97.5% Chebyshev (MVUE) UCL	15.62
95% Modified-t UCL (Johnson-1978)	11.87	99% Chebyshev (MVUE) UCL	18.93

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.598	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.17		
MLE of Mean	10.06		
MLE of Standard Deviation	3.431		
nu star	206.3		
Approximate Chi Square Value (.05)	174.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.65
Adjusted Chi Square Value	169.6	95% Jackknife UCL	11.8
		95% Standard Bootstrap UCL	11.58
Anderson-Darling Test Statistic	0.525	95% Bootstrap-t UCL	12.4
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	20.16
Kolmogorov-Smirnov Test Statistic	0.192	95% Percentile Bootstrap UCL	11.68
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	12
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.27
		97.5% Chebyshev(Mean, Sd) UCL	16.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.67
95% Approximate Gamma UCL	11.92		
95% Adjusted Gamma UCL	12.24		

Potential UCL to Use		Use 95% Approximate Gamma UCL	11.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.58	Minimum of Log Data	-0.545
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.637	Mean of log Data	-0.452
Median	0.637	SD of log Data	0.0402
SD	0.0257		
Coefficient of Variation	0.0404		
Skewness	0.461		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.637
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.65	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.669
95% Adjusted-CLT UCL (Chen-1995)	0.65	97.5% Chebyshev (MVUE) UCL	0.683
95% Modified-t UCL (Johnson-1978)	0.65	99% Chebyshev (MVUE) UCL	0.71

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	505.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0013		
MLE of Mean	0.637		
MLE of Standard Deviation	0.0283		
nu star	12125		
Approximate Chi Square Value (.05)	11870	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.649
Adjusted Chi Square Value	11831	95% Jackknife UCL	0.65
		95% Standard Bootstrap UCL	0.648
Anderson-Darling Test Statistic	2.428	95% Bootstrap-t UCL	0.649
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.658
Kolmogorov-Smirnov Test Statistic	0.412	95% Percentile Bootstrap UCL	0.647
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.652
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.669
		97.5% Chebyshev(Mean, Sd) UCL	0.683
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.71
95% Approximate Gamma UCL	0.65		
95% Adjusted Gamma UCL	0.652		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.65
	or 95% Modified-t UCL	0.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.017	Minimum of Log Data	-4.075
Maximum	0.32	Maximum of Log Data	-1.139
Mean	0.12	Mean of log Data	-2.345
Median	0.12	SD of log Data	0.801
SD	0.074		
Coefficient of Variation	0.618		
Skewness	1.623		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.654	Shapiro Wilk Test Statistic	0.668
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.158	95% H-UCL	0.246
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.263
95% Adjusted-CLT UCL (Chen-1995)	0.165	97.5% Chebyshev (MVUE) UCL	0.322
95% Modified-t UCL (Johnson-1978)	0.16	99% Chebyshev (MVUE) UCL	0.437

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.861	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0643		
MLE of Mean	0.12		
MLE of Standard Deviation	0.0877		
nu star	44.67		
Approximate Chi Square Value (.05)	30.34	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.155
Adjusted Chi Square Value	28.55	95% Jackknife UCL	0.158
		95% Standard Bootstrap UCL	0.153
Anderson-Darling Test Statistic	2.116	95% Bootstrap-t UCL	0.17
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.354
Kolmogorov-Smirnov Test Statistic	0.419	95% Percentile Bootstrap UCL	0.153
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	0.161
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.213
		97.5% Chebyshev(Mean, Sd) UCL	0.253
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.332
95% Approximate Gamma UCL	0.176		
95% Adjusted Gamma UCL	0.187		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.213

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	35.49	Minimum of Log Data	3.569
Maximum	57.42	Maximum of Log Data	4.05
Mean	43.36	Mean of log Data	3.76
Median	41.5	SD of log Data	0.141
SD	6.442		
Coefficient of Variation	0.149		
Skewness	1.154		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	46.7	95% H-UCL	46.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.04
95% Adjusted-CLT UCL (Chen-1995)	47.08	97.5% Chebyshev (MVUE) UCL	54.37
95% Modified-t UCL (Johnson-1978)	46.8	99% Chebyshev (MVUE) UCL	60.91

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	40.04	Data appear Normal at 5% Significance Level	
Theta Star	1.083		
MLE of Mean	43.36		
MLE of Standard Deviation	6.852		
nu star	961		
Approximate Chi Square Value (.05)	890.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	46.42
Adjusted Chi Square Value	879.6	95% Jackknife UCL	46.7
		95% Standard Bootstrap UCL	46.31
Anderson-Darling Test Statistic	0.64	95% Bootstrap-t UCL	48.16
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	47.66
Kolmogorov-Smirnov Test Statistic	0.225	95% Percentile Bootstrap UCL	46.52
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	47.02
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	51.46
		97.5% Chebyshev(Mean, Sd) UCL	54.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	61.86
95% Approximate Gamma UCL	46.82		
95% Adjusted Gamma UCL	47.37		

Potential UCL to Use		Use 95% Student's-t UCL	46.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	10070	Minimum of Log Data	9.217
Maximum	45722	Maximum of Log Data	10.73
Mean	18110	Mean of log Data	9.715
Median	14754	SD of log Data	0.405
SD	9617		
Coefficient of Variation	0.531		
Skewness	2.47		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.699	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	23095	95% H-UCL	23059
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27114
95% Adjusted-CLT UCL (Chen-1995)	24791	97.5% Chebyshev (MVUE) UCL	31120
95% Modified-t UCL (Johnson-1978)	23425	99% Chebyshev (MVUE) UCL	38988

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.389	Data appear Lognormal at 5% Significance Level	
Theta Star	4126		
MLE of Mean	18110		
MLE of Standard Deviation	8644		
nu star	105.3		
Approximate Chi Square Value (.05)	82.66	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	22676
Adjusted Chi Square Value	79.6	95% Jackknife UCL	23095
		95% Standard Bootstrap UCL	22534
Anderson-Darling Test Statistic	0.882	95% Bootstrap-t UCL	28763
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	39824
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	23002
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	24780
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30211
		97.5% Chebyshev(Mean, Sd) UCL	35447
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	45732
95% Approximate Gamma UCL	23080		
95% Adjusted Gamma UCL	23968		

Potential UCL to Use		
	Use 95% Student's-t UCL	23095
	or 95% Modified-t UCL	23425
	or 95% H-UCL	23059

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	243.4	Minimum of Log Data	5.495
Maximum	983.6	Maximum of Log Data	6.891
Mean	482.4	Mean of log Data	6.085
Median	395.2	SD of log Data	0.442
SD	231.6		
Coefficient of Variation	0.48		
Skewness	1.18		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	602.5	95% H-UCL	638.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	751.8
95% Adjusted-CLT UCL (Chen-1995)	616.7	97.5% Chebyshev (MVUE) UCL	869.4
95% Modified-t UCL (Johnson-1978)	606.3	99% Chebyshev (MVUE) UCL	1101

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.169	Data appear Normal at 5% Significance Level	
Theta Star	115.7		
MLE of Mean	482.4		
MLE of Standard Deviation	236.3		
nu star	100.1		
Approximate Chi Square Value (.05)	77.97	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	592.4
Adjusted Chi Square Value	75.01	95% Jackknife UCL	602.5
		95% Standard Bootstrap UCL	587.9
Anderson-Darling Test Statistic	0.401	95% Bootstrap-t UCL	653.5
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	659.3
Kolmogorov-Smirnov Test Statistic	0.166	95% Percentile Bootstrap UCL	598.8
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	611.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	773.8
		97.5% Chebyshev(Mean, Sd) UCL	900
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1148
95% Approximate Gamma UCL	618.9		
95% Adjusted Gamma UCL	643.4		

Potential UCL to Use		Use 95% Student's-t UCL	602.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0176	Minimum of Log Data	-4.04
Maximum	10	Maximum of Log Data	2.303
Mean	7.259	Mean of log Data	0.756
Median	10	SD of log Data	2.734
SD	4.443		
Coefficient of Variation	0.612		
Skewness	-1.207		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.619	Shapiro Wilk Test Statistic	0.583
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.562	95% H-UCL	20424
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	162.6
95% Adjusted-CLT UCL (Chen-1995)	8.891	97.5% Chebyshev (MVUE) UCL	217.3
95% Modified-t UCL (Johnson-1978)	9.488	99% Chebyshev (MVUE) UCL	324.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.442	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.42		
MLE of Mean	7.259		
MLE of Standard Deviation	10.92		
nu star	10.61		
Approximate Chi Square Value (.05)	4.328	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.368
Adjusted Chi Square Value	3.735	95% Jackknife UCL	9.562
		95% Standard Bootstrap UCL	9.279
Anderson-Darling Test Statistic	2.891	95% Bootstrap-t UCL	9.021
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	8.858
Kolmogorov-Smirnov Test Statistic	0.425	95% Percentile Bootstrap UCL	9.168
Kolmogorov-Smirnov 5% Critical Value	0.258	95% BCA Bootstrap UCL	8.921
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.85
		97.5% Chebyshev(Mean, Sd) UCL	15.27
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.02
95% Approximate Gamma UCL	17.8		
95% Adjusted Gamma UCL	20.62		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.02
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	13.4	Minimum of Log Data	2.595
Maximum	84.13	Maximum of Log Data	4.432
Mean	60.82	Mean of log Data	3.973
Median	65	SD of log Data	0.647
SD	23.23		
Coefficient of Variation	0.382		
Skewness	-1.593		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.715	Shapiro Wilk Test Statistic	0.594
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.86	95% H-UCL	103.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	118.5
95% Adjusted-CLT UCL (Chen-1995)	68.55	97.5% Chebyshev (MVUE) UCL	142
95% Modified-t UCL (Johnson-1978)	72.35	99% Chebyshev (MVUE) UCL	188.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.957	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.57		
MLE of Mean	60.82		
MLE of Standard Deviation	35.37		
nu star	70.96		
Approximate Chi Square Value (.05)	52.57	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	71.85
Adjusted Chi Square Value	50.16	95% Jackknife UCL	72.86
		95% Standard Bootstrap UCL	71.33
Anderson-Darling Test Statistic	2.235	95% Bootstrap-t UCL	70.21
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	69.23
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	70.66
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	69.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	90.05
		97.5% Chebyshev(Mean, Sd) UCL	102.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	127.5
95% Approximate Gamma UCL	82.1		
95% Adjusted Gamma UCL	86.04		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	90.05

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0081	Minimum of Log Data	-4.816
Maximum	0.0228	Maximum of Log Data	-3.781
Mean	0.013	Mean of log Data	-4.372
Median	0.013	SD of log Data	0.26
SD	0.0036		
Coefficient of Variation	0.277		
Skewness	1.625		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.7
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0149	95% H-UCL	0.0151
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0173
95% Adjusted-CLT UCL (Chen-1995)	0.0153	97.5% Chebyshev (MVUE) UCL	0.0192
95% Modified-t UCL (Johnson-1978)	0.015	99% Chebyshev (MVUE) UCL	0.0228

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.03	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0011		
MLE of Mean	0.013		
MLE of Standard Deviation	0.0038		
nu star	288.7		
Approximate Chi Square Value (.05)	250.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.0147
Adjusted Chi Square Value	244.9	95% Jackknife UCL	0.0149
		95% Standard Bootstrap UCL	0.0147
Anderson-Darling Test Statistic	2.043	95% Bootstrap-t UCL	0.0155
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.0245
Kolmogorov-Smirnov Test Statistic	0.383	95% Percentile Bootstrap UCL	0.0147
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.0155
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0176
		97.5% Chebyshev(Mean, Sd) UCL	0.0195
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0234
95% Approximate Gamma UCL	0.015		
95% Adjusted Gamma UCL	0.0154		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0149
	or 95% Modified-t UCL	0.015

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-25.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Aluminum

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Aluminum was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	5.91	Minimum of Log Data	1.777
Maximum	11	Maximum of Log Data	2.398
Mean	9.66	Mean of log Data	2.255
Median	9.66	SD of log Data	0.179
SD	1.461		
Coefficient of Variation	0.151		
Skewness	-2.048		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.706	Shapiro Wilk Test Statistic	0.644
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.51	95% H-UCL	10.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.07
95% Adjusted-CLT UCL (Chen-1995)	10.1	97.5% Chebyshev (MVUE) UCL	13.1
95% Modified-t UCL (Johnson-1978)	10.46	99% Chebyshev (MVUE) UCL	15.14

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	27.41	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.352		
MLE of Mean	9.66		
MLE of Standard Deviation	1.845		
nu star	548.3		
Approximate Chi Square Value (.05)	495	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	10.42
Adjusted Chi Square Value	486.2	95% Jackknife UCL	10.51
		95% Standard Bootstrap UCL	10.36
Anderson-Darling Test Statistic	1.461	95% Bootstrap-t UCL	10.27
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	10.19
Kolmogorov-Smirnov Test Statistic	0.377	95% Percentile Bootstrap UCL	10.29
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	10.17
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.67
		97.5% Chebyshev(Mean, Sd) UCL	12.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.26
95% Approximate Gamma UCL	10.7		
95% Adjusted Gamma UCL	10.89		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.51
	or 95% Modified-t UCL	10.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Barium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Beryllium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	32.79	Minimum of Log Data	3.49
Maximum	61.25	Maximum of Log Data	4.115
Mean	47.3	Mean of log Data	3.841
Median	47.3	SD of log Data	0.183
SD	8.568		
Coefficient of Variation	0.181		
Skewness	0.283		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	52.26	95% H-UCL	53.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	59.3
95% Adjusted-CLT UCL (Chen-1995)	52.01	97.5% Chebyshev (MVUE) UCL	64.49
95% Modified-t UCL (Johnson-1978)	52.3	99% Chebyshev (MVUE) UCL	74.69

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	23.58	Data appear Normal at 5% Significance Level	
Theta Star	2.006		
MLE of Mean	47.3		
MLE of Standard Deviation	9.74		
nu star	471.6		
Approximate Chi Square Value (.05)	422.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	51.75
Adjusted Chi Square Value	414.1	95% Jackknife UCL	52.26
		95% Standard Bootstrap UCL	51.48
Anderson-Darling Test Statistic	0.635	95% Bootstrap-t UCL	53.15
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	55.76
Kolmogorov-Smirnov Test Statistic	0.277	95% Percentile Bootstrap UCL	51.39
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	51.72
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	59.11
		97.5% Chebyshev(Mean, Sd) UCL	64.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	74.25
95% Approximate Gamma UCL	52.82		
95% Adjusted Gamma UCL	53.86		

Potential UCL to Use		Use 95% Student's-t UCL	52.26

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	169.2	Minimum of Log Data	5.131
Maximum	1800	Maximum of Log Data	7.496
Mean	545.2	Mean of log Data	6.061
Median	545.2	SD of log Data	0.7
SD	470		
Coefficient of Variation	0.862		
Skewness	2.453		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.663	Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	817.7	95% H-UCL	989.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1062
95% Adjusted-CLT UCL (Chen-1995)	912.9	97.5% Chebyshev (MVUE) UCL	1291
95% Modified-t UCL (Johnson-1978)	836.9	99% Chebyshev (MVUE) UCL	1742

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.629	Data appear Lognormal at 5% Significance Level	
Theta Star	334.6		
MLE of Mean	545.2		
MLE of Standard Deviation	427.2		
nu star	32.59		
Approximate Chi Square Value (.05)	20.54	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	789.7
Adjusted Chi Square Value	18.89	95% Jackknife UCL	817.7
		95% Standard Bootstrap UCL	773.9
Anderson-Darling Test Statistic	0.791	95% Bootstrap-t UCL	1069
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	1791
Kolmogorov-Smirnov Test Statistic	0.311	95% Percentile Bootstrap UCL	816
Kolmogorov-Smirnov 5% Critical Value	0.269	95% BCA Bootstrap UCL	904.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1193
		97.5% Chebyshev(Mean, Sd) UCL	1473
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2024
95% Approximate Gamma UCL	865.1		
95% Adjusted Gamma UCL	940.5		

Potential UCL to Use		Use 95% H-UCL	989.6

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	11.9	Minimum of Log Data	2.477
Maximum	65	Maximum of Log Data	4.174
Mean	54.04	Mean of log Data	3.91
Median	54.04	SD of log Data	0.511
SD	15.71		
Coefficient of Variation	0.291		
Skewness	-2.51		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.509
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.15	95% H-UCL	83.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.28
95% Adjusted-CLT UCL (Chen-1995)	58	97.5% Chebyshev (MVUE) UCL	113.7
95% Modified-t UCL (Johnson-1978)	62.5	99% Chebyshev (MVUE) UCL	147.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.549	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.88		
MLE of Mean	54.04		
MLE of Standard Deviation	25.34		
nu star	90.98		
Approximate Chi Square Value (.05)	69.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	62.22
Adjusted Chi Square Value	66.8	95% Jackknife UCL	63.15
		95% Standard Bootstrap UCL	61.8
Anderson-Darling Test Statistic	2.036	95% Bootstrap-t UCL	60.4
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	59.33
Kolmogorov-Smirnov Test Statistic	0.453	95% Percentile Bootstrap UCL	60.45
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	59.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.7
		97.5% Chebyshev(Mean, Sd) UCL	85.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	103.5
95% Approximate Gamma UCL	70.26		
95% Adjusted Gamma UCL	73.61		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	75.7
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-26.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11400	Minimum of Log Data	9.341
Maximum	12500	Maximum of Log Data	9.433
Mean	11950	Mean of log Data	9.388
Median	11950	SD of log Data	0.0196
SD	234.5		
Coefficient of Variation	0.0196		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12072	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12245
95% Adjusted-CLT UCL (Chen-1995)	12061	97.5% Chebyshev (MVUE) UCL	12373
95% Modified-t UCL (Johnson-1978)	12072	99% Chebyshev (MVUE) UCL	12624

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2122	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.63E+00		
MLE of Mean	11950		
MLE of Standard Deviation	259.4		
nu star	50934		
Approximate Chi Square Value (.05)	50411	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12061
Adjusted Chi Square Value	50331	95% Jackknife UCL	12072
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.744	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12245
		97.5% Chebyshev(Mean, Sd) UCL	12373
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12624
95% Approximate Gamma UCL	12074		
95% Adjusted Gamma UCL	12093		

Potential UCL to Use		
	Use 95% Student's-t UCL	12072
	or 95% Modified-t UCL	12072

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.82	Minimum of Log Data	1.761
Maximum	11	Maximum of Log Data	2.398
Mean	8.625	Mean of log Data	2.137
Median	8.625	SD of log Data	0.197
SD	1.683		
Coefficient of Variation	0.195		
Skewness	0.232		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.498	95% H-UCL	9.641
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.78
95% Adjusted-CLT UCL (Chen-1995)	9.459	97.5% Chebyshev (MVUE) UCL	11.71
95% Modified-t UCL (Johnson-1978)	9.503	99% Chebyshev (MVUE) UCL	13.54

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	21.4	Data appear Normal at 5% Significance Level	
Theta Star	0.403		
MLE of Mean	8.625		
MLE of Standard Deviation	1.865		
nu star	513.5		
Approximate Chi Square Value (.05)	462	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.424
Adjusted Chi Square Value	454.5	95% Jackknife UCL	9.498
		95% Standard Bootstrap UCL	9.394
Anderson-Darling Test Statistic	0.398	95% Bootstrap-t UCL	9.542
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	9.492
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	9.444
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	9.399
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.74
		97.5% Chebyshev(Mean, Sd) UCL	11.66
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.46
95% Approximate Gamma UCL	9.587		
95% Adjusted Gamma UCL	9.745		

Potential UCL to Use		Use 95% Student's-t UCL	9.498

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.7	Minimum of Log Data	-0.357
Maximum	0.75	Maximum of Log Data	-0.288
Mean	0.725	Mean of log Data	-0.322
Median	0.725	SD of log Data	0.0147
SD	0.0107		
Coefficient of Variation	0.0147		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.731	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		0.738
95% Adjusted-CLT UCL (Chen-1995)	0.73	97.5% Chebyshev (MVUE) UCL		0.744
95% Modified-t UCL (Johnson-1978)	0.731	99% Chebyshev (MVUE) UCL		0.756

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	3782	Data do not follow a Discernable Distribution (0.05)		
Theta Star	1.92E-04			
MLE of Mean	0.725			
MLE of Standard Deviation	0.0118			
nu star	90778			
Approximate Chi Square Value (.05)	90079	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		0.73
Adjusted Chi Square Value	89972	95% Jackknife UCL		0.731
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.954	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.738
		97.5% Chebyshev(Mean, Sd) UCL		0.744
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.756
95% Approximate Gamma UCL	0.731			
95% Adjusted Gamma UCL	0.731			

Potential UCL to Use		
	Use 95% Student's-t UCL	0.731
	or 95% Modified-t UCL	0.731

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	14.6	Minimum of Log Data	2.681
Maximum	85	Maximum of Log Data	4.443
Mean	55.34	Mean of log Data	3.885
Median	51.72	SD of log Data	0.58
SD	25.2		
Coefficient of Variation	0.455		
Skewness	-1.26E-01		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.4	95% H-UCL	85.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.34
95% Adjusted-CLT UCL (Chen-1995)	67.02	97.5% Chebyshev (MVUE) UCL	117.8
95% Modified-t UCL (Johnson-1978)	68.36	99% Chebyshev (MVUE) UCL	154

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.097	Data appear Normal at 5% Significance Level	
Theta Star	17.87		
MLE of Mean	55.34		
MLE of Standard Deviation	31.44		
nu star	74.33		
Approximate Chi Square Value (.05)	55.47	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	67.3
Adjusted Chi Square Value	53	95% Jackknife UCL	68.4
		95% Standard Bootstrap UCL	66.58
Anderson-Darling Test Statistic	0.649	95% Bootstrap-t UCL	68.41
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	66.21
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	66.53
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	66.14
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.05
		97.5% Chebyshev(Mean, Sd) UCL	100.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	127.7
95% Approximate Gamma UCL	74.14		
95% Adjusted Gamma UCL	77.61		

Potential UCL to Use		Use 95% Student's-t UCL	68.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	9.4	Minimum of Log Data	2.241
Maximum	16	Maximum of Log Data	2.773
Mean	12.7	Mean of log Data	2.536
Median	12.7	SD of log Data	0.114
SD	1.407		
Coefficient of Variation	0.111		
Skewness	-2.50E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.591
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.43	95% H-UCL	13.51
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.53
95% Adjusted-CLT UCL (Chen-1995)	13.37	97.5% Chebyshev (MVUE) UCL	15.32
95% Modified-t UCL (Johnson-1978)	13.43	99% Chebyshev (MVUE) UCL	16.87

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	64.55	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.197			
MLE of Mean	12.7			
MLE of Standard Deviation	1.581			
nu star	1549			
Approximate Chi Square Value (.05)	1459	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		13.37
Adjusted Chi Square Value	1445	95% Jackknife UCL		13.43
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.725	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		14.47
		97.5% Chebyshev(Mean, Sd) UCL		15.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		16.74
95% Approximate Gamma UCL	13.49			
95% Adjusted Gamma UCL	13.61			

Potential UCL to Use		
	Use 95% Student's-t UCL	13.43
	or 95% Modified-t UCL	13.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	147.7	Minimum of Log Data	4.995
Maximum	904	Maximum of Log Data	6.807
Mean	489.6	Mean of log Data	6.045
Median	442.6	SD of log Data	0.596
SD	261.5		
Coefficient of Variation	0.534		
Skewness	0.518		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	625.1	95% H-UCL	757.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	879.5
95% Adjusted-CLT UCL (Chen-1995)	625.8	97.5% Chebyshev (MVUE) UCL	1046
95% Modified-t UCL (Johnson-1978)	627	99% Chebyshev (MVUE) UCL	1372

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.703	Data appear Normal at 5% Significance Level	
Theta Star	181.1		
MLE of Mean	489.6		
MLE of Standard Deviation	297.8		
nu star	64.87		
Approximate Chi Square Value (.05)	47.34	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	613.7
Adjusted Chi Square Value	45.06	95% Jackknife UCL	625.1
		95% Standard Bootstrap UCL	608.1
Anderson-Darling Test Statistic	0.542	95% Bootstrap-t UCL	642.6
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	619.6
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	610.5
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	614.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	818.6
		97.5% Chebyshev(Mean, Sd) UCL	961
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1241
95% Approximate Gamma UCL	670.9		
95% Adjusted Gamma UCL	704.8		

Potential UCL to Use		Use 95% Student's-t UCL	625.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.046	Minimum of Log Data	-3.079
Maximum	10.27	Maximum of Log Data	2.329
Mean	8.036	Mean of log Data	1.371
Median	10	SD of log Data	2.081
SD	3.81		
Coefficient of Variation	0.474		
Skewness	-1.886		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.491
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.01	95% H-UCL	861.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	87.15
95% Adjusted-CLT UCL (Chen-1995)	9.205	97.5% Chebyshev (MVUE) UCL	115
95% Modified-t UCL (Johnson-1978)	9.912	99% Chebyshev (MVUE) UCL	169.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.677	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.86		
MLE of Mean	8.036		
MLE of Standard Deviation	9.764		
nu star	16.26		
Approximate Chi Square Value (.05)	8.143	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.845
Adjusted Chi Square Value	7.283	95% Jackknife UCL	10.01
		95% Standard Bootstrap UCL	9.744
Anderson-Darling Test Statistic	3.305	95% Bootstrap-t UCL	9.511
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	9.322
Kolmogorov-Smirnov Test Statistic	0.478	95% Percentile Bootstrap UCL	9.695
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	9.368
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.83
		97.5% Chebyshev(Mean, Sd) UCL	14.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.98
95% Approximate Gamma UCL	16.04		
95% Adjusted Gamma UCL	17.94		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.98
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.19	Minimum of Log Data	-1.661
Maximum	0.39	Maximum of Log Data	-0.942
Mean	0.29	Mean of log Data	-1.248
Median	0.29	SD of log Data	0.155
SD	0.0426		
Coefficient of Variation	0.147		
Skewness	-2.44E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.584
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.312	95% H-UCL	0.316
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.347
95% Adjusted-CLT UCL (Chen-1995)	0.31	97.5% Chebyshev (MVUE) UCL	0.372
95% Modified-t UCL (Johnson-1978)	0.312	99% Chebyshev (MVUE) UCL	0.42

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	35.73	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00812		
MLE of Mean	0.29		
MLE of Standard Deviation	0.0485		
nu star	857.5		
Approximate Chi Square Value (.05)	790.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.31
Adjusted Chi Square Value	780.7	95% Jackknife UCL	0.312
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.733	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.436	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.344
		97.5% Chebyshev(Mean, Sd) UCL	0.367
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.412
95% Approximate Gamma UCL	0.315		
95% Adjusted Gamma UCL	0.319		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.312
	or 95% Modified-t UCL	0.312

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	29.5	Minimum of Log Data	3.384
Maximum	44.1	Maximum of Log Data	3.786
Mean	36.8	Mean of log Data	3.602
Median	36.8	SD of log Data	0.0861
SD	3.113		
Coefficient of Variation	0.0846		
Skewness	-4.11E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.595
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	38.41	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		40.79
95% Adjusted-CLT UCL (Chen-1995)	38.28	97.5% Chebyshev (MVUE) UCL		42.52
95% Modified-t UCL (Johnson-1978)	38.41	99% Chebyshev (MVUE) UCL		45.91

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	112.3	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.328			
MLE of Mean	36.8			
MLE of Standard Deviation	3.473			
nu star	2695			
Approximate Chi Square Value (.05)	2575	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		38.28
Adjusted Chi Square Value	2557	95% Jackknife UCL		38.41
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.72	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.428	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		40.72
		97.5% Chebyshev(Mean, Sd) UCL		42.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		45.74
95% Approximate Gamma UCL	38.51			
95% Adjusted Gamma UCL	38.78			

Potential UCL to Use		
	Use 95% Student's-t UCL	38.41
	or 95% Modified-t UCL	38.41

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-27.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.27	Minimum of Log Data	-1.309
Maximum	0.64	Maximum of Log Data	-0.446
Mean	0.455	Mean of log Data	-0.803
Median	0.455	SD of log Data	0.187
SD	0.0789		
Coefficient of Variation	0.173		
Skewness	-2.51E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.578
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.496	95% H-UCL	0.506
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.563
95% Adjusted-CLT UCL (Chen-1995)	0.492	97.5% Chebyshev (MVUE) UCL	0.61
95% Modified-t UCL (Johnson-1978)	0.496	99% Chebyshev (MVUE) UCL	0.701

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.08	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0181		
MLE of Mean	0.455		
MLE of Standard Deviation	0.0909		
nu star	602		
Approximate Chi Square Value (.05)	546.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.492
Adjusted Chi Square Value	537.9	95% Jackknife UCL	0.496
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.742	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.554
		97.5% Chebyshev(Mean, Sd) UCL	0.597
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.682
95% Approximate Gamma UCL	0.502		
95% Adjusted Gamma UCL	0.509		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.496
	or 95% Modified-t UCL	0.496

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.38	Minimum of Log Data	1.683
Maximum	16.08	Maximum of Log Data	2.778
Mean	9.11	Mean of log Data	2.162
Median	9.11	SD of log Data	0.322
SD	2.974		
Coefficient of Variation	0.326		
Skewness	0.921		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.65	95% H-UCL	11.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.84
95% Adjusted-CLT UCL (Chen-1995)	10.77	97.5% Chebyshev (MVUE) UCL	14.45
95% Modified-t UCL (Johnson-1978)	10.69	99% Chebyshev (MVUE) UCL	17.62

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.101	Data appear Normal at 5% Significance Level	
Theta Star	1.125		
MLE of Mean	9.11		
MLE of Standard Deviation	3.201		
nu star	194.4		
Approximate Chi Square Value (.05)	163.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.52
Adjusted Chi Square Value	158.8	95% Jackknife UCL	10.65
		95% Standard Bootstrap UCL	10.49
Anderson-Darling Test Statistic	0.418	95% Bootstrap-t UCL	10.94
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	11.59
Kolmogorov-Smirnov Test Statistic	0.147	95% Percentile Bootstrap UCL	10.47
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.73
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.85
		97.5% Chebyshev(Mean, Sd) UCL	14.47
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.65
95% Approximate Gamma UCL	10.86		
95% Adjusted Gamma UCL	11.15		

Potential UCL to Use		Use 95% Student's-t UCL	10.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	42.55	Minimum of Log Data	3.751
Maximum	57.43	Maximum of Log Data	4.051
Mean	49.41	Mean of log Data	3.897
Median	49.41	SD of log Data	0.0852
SD	4.247		
Coefficient of Variation	0.0859		
Skewness	0.416		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Test Statistic	0.976
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	51.61	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54.72
95% Adjusted-CLT UCL (Chen-1995)	51.59	97.5% Chebyshev (MVUE) UCL	57.01
95% Modified-t UCL (Johnson-1978)	51.64	99% Chebyshev (MVUE) UCL	61.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	112.3	Data appear Normal at 5% Significance Level	
Theta Star	0.44		
MLE of Mean	49.41		
MLE of Standard Deviation	4.663		
nu star	2695		
Approximate Chi Square Value (.05)	2575	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	51.43
Adjusted Chi Square Value	2557	95% Jackknife UCL	51.61
		95% Standard Bootstrap UCL	51.32
Anderson-Darling Test Statistic	0.229	95% Bootstrap-t UCL	51.95
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	51.91
Kolmogorov-Smirnov Test Statistic	0.156	95% Percentile Bootstrap UCL	51.44
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	51.61
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	54.76
		97.5% Chebyshev(Mean, Sd) UCL	57.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	61.61
95% Approximate Gamma UCL	51.71		
95% Adjusted Gamma UCL	52.07		

Potential UCL to Use		Use 95% Student's-t UCL	51.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	10.2	Minimum of Log Data	2.322
Maximum	65.5	Maximum of Log Data	4.182
Mean	52.17	Mean of log Data	3.812
Median	61.1	SD of log Data	0.673
SD	20.05		
Coefficient of Variation	0.384		
Skewness	-1.731		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.67	Shapiro Wilk Test Statistic	0.581
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	62.56	95% H-UCL	91.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.3
95% Adjusted-CLT UCL (Chen-1995)	58.6	97.5% Chebyshev (MVUE) UCL	125.4
95% Modified-t UCL (Johnson-1978)	62.08	99% Chebyshev (MVUE) UCL	166.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.799	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.64		
MLE of Mean	52.17		
MLE of Standard Deviation	31.18		
nu star	67.17		
Approximate Chi Square Value (.05)	49.31	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	61.69
Adjusted Chi Square Value	46.98	95% Jackknife UCL	62.56
		95% Standard Bootstrap UCL	61.23
Anderson-Darling Test Statistic	2.27	95% Bootstrap-t UCL	59.99
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	59.01
Kolmogorov-Smirnov Test Statistic	0.403	95% Percentile Bootstrap UCL	60.71
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	58.93
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.39
		97.5% Chebyshev(Mean, Sd) UCL	88.31
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.8
95% Approximate Gamma UCL	71.06		
95% Adjusted Gamma UCL	74.58		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	77.39

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	10.3	Maximum of Log Data	2.332
Mean	7.862	Mean of log Data	1.32
Median	10	SD of log Data	2.146
SD	3.784		
Coefficient of Variation	0.481		
Skewness	-1.77		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.646	Shapiro Wilk Test Statistic	0.509
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.824	95% H-UCL	1143
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.35
95% Adjusted-CLT UCL (Chen-1995)	9.062	97.5% Chebyshev (MVUE) UCL	123.4
95% Modified-t UCL (Johnson-1978)	9.731	99% Chebyshev (MVUE) UCL	182.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.655	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12		
MLE of Mean	7.862		
MLE of Standard Deviation	9.712		
nu star	15.73		
Approximate Chi Square Value (.05)	7.769	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.659
Adjusted Chi Square Value	6.932	95% Jackknife UCL	9.824
		95% Standard Bootstrap UCL	9.592
Anderson-Darling Test Statistic	3.096	95% Bootstrap-t UCL	9.276
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	9.191
Kolmogorov-Smirnov Test Statistic	0.48	95% Percentile Bootstrap UCL	9.509
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	9.162
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.62
		97.5% Chebyshev(Mean, Sd) UCL	14.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.73
95% Approximate Gamma UCL	15.91		
95% Adjusted Gamma UCL	17.84		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.73

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-28.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	5.93	Minimum of Log Data	1.78
Maximum	14.8	Maximum of Log Data	2.695
Mean	9.808	Mean of log Data	2.243
Median	10.38	SD of log Data	0.301
SD	2.84		
Coefficient of Variation	0.29		
Skewness	0.21		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.28	95% H-UCL	11.74
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.57
95% Adjusted-CLT UCL (Chen-1995)	11.21	97.5% Chebyshev (MVUE) UCL	15.19
95% Modified-t UCL (Johnson-1978)	11.29	99% Chebyshev (MVUE) UCL	18.38

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.492	Data appear Normal at 5% Significance Level	
Theta Star	1.033		
MLE of Mean	9.808		
MLE of Standard Deviation	3.183		
nu star	227.8		
Approximate Chi Square Value (.05)	193.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.16
Adjusted Chi Square Value	189.1	95% Jackknife UCL	11.28
		95% Standard Bootstrap UCL	11.1
Anderson-Darling Test Statistic	0.385	95% Bootstrap-t UCL	11.41
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.31
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	11.09
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.08
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.38
		97.5% Chebyshev(Mean, Sd) UCL	14.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.97
95% Approximate Gamma UCL	11.52		
95% Adjusted Gamma UCL	11.82		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.71	Minimum of Log Data	-0.342
Maximum	0.76	Maximum of Log Data	-0.274
Mean	0.735	Mean of log Data	-0.308
Median	0.735	SD of log Data	0.0145
SD	0.0107		
Coefficient of Variation	0.0145		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.741	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.748
95% Adjusted-CLT UCL (Chen-1995)	0.74	97.5% Chebyshev (MVUE) UCL	0.754
95% Modified-t UCL (Johnson-1978)	0.741	99% Chebyshev (MVUE) UCL	0.766

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3888	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.89E-04		
MLE of Mean	0.735		
MLE of Standard Deviation	0.0118		
nu star	93301		
Approximate Chi Square Value (.05)	92592	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.74
Adjusted Chi Square Value	92484	95% Jackknife UCL	0.741
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.973	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.497	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.748
		97.5% Chebyshev(Mean, Sd) UCL	0.754
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.766
95% Approximate Gamma UCL	0.741		
95% Adjusted Gamma UCL	0.741		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.741
	or 95% Modified-t UCL	0.741

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	35.39	Minimum of Log Data	3.566
Maximum	86.43	Maximum of Log Data	4.459
Mean	54.99	Mean of log Data	3.968
Median	47.73	SD of log Data	0.288
SD	16.57		
Coefficient of Variation	0.301		
Skewness	0.789		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.901	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.58	95% H-UCL	65.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	75
95% Adjusted-CLT UCL (Chen-1995)	64.02	97.5% Chebyshev (MVUE) UCL	83.69
95% Modified-t UCL (Johnson-1978)	63.76	99% Chebyshev (MVUE) UCL	100.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.756	Data appear Normal at 5% Significance Level	
Theta Star	5.636		
MLE of Mean	54.99		
MLE of Standard Deviation	17.6		
nu star	234.1		
Approximate Chi Square Value (.05)	199.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	62.86
Adjusted Chi Square Value	194.9	95% Jackknife UCL	63.58
		95% Standard Bootstrap UCL	62.72
Anderson-Darling Test Statistic	0.456	95% Bootstrap-t UCL	64.78
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	63.83
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	62.95
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	64.11
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.84
		97.5% Chebyshev(Mean, Sd) UCL	84.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	102.6
95% Approximate Gamma UCL	64.46		
95% Adjusted Gamma UCL	66.07		

Potential UCL to Use		Use 95% Student's-t UCL	63.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	264.7	Minimum of Log Data	5.579
Maximum	2400	Maximum of Log Data	7.783
Mean	799.1	Mean of log Data	6.433
Median	566	SD of log Data	0.715
SD	642.3		
Coefficient of Variation	0.804		
Skewness	1.598		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.796	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1132	95% H-UCL	1358
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1518
95% Adjusted-CLT UCL (Chen-1995)	1195	97.5% Chebyshev (MVUE) UCL	1837
95% Modified-t UCL (Johnson-1978)	1146	99% Chebyshev (MVUE) UCL	2462

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.667	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	479.2		
MLE of Mean	799.1		
MLE of Standard Deviation	618.8		
nu star	40.02		
Approximate Chi Square Value (.05)	26.52	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1104
Adjusted Chi Square Value	24.86	95% Jackknife UCL	1132
		95% Standard Bootstrap UCL	1090
Anderson-Darling Test Statistic	0.614	95% Bootstrap-t UCL	1315
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	1223
Kolmogorov-Smirnov Test Statistic	0.231	95% Percentile Bootstrap UCL	1108
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	1192
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1607
		97.5% Chebyshev(Mean, Sd) UCL	1957
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2644
95% Approximate Gamma UCL	1206		
95% Adjusted Gamma UCL	1286		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1206

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	13.6	Minimum of Log Data	2.61
Maximum	69.74	Maximum of Log Data	4.245
Mean	61.05	Mean of log Data	4.048
Median	65	SD of log Data	0.455
SD	15.18		
Coefficient of Variation	0.249		
Skewness	-3.275		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.469	Shapiro Wilk Test Statistic	0.4
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.92	95% H-UCL	84.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.71
95% Adjusted-CLT UCL (Chen-1995)	63.83	97.5% Chebyshev (MVUE) UCL	115.6
95% Modified-t UCL (Johnson-1978)	68.23	99% Chebyshev (MVUE) UCL	146.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.098	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.01		
MLE of Mean	61.05		
MLE of Standard Deviation	24.72		
nu star	146.4		
Approximate Chi Square Value (.05)	119.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	68.26
Adjusted Chi Square Value	115.7	95% Jackknife UCL	68.92
		95% Standard Bootstrap UCL	67.83
Anderson-Darling Test Statistic	3.299	95% Bootstrap-t UCL	66.25
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	65.44
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	66.15
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65.63
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.15
		97.5% Chebyshev(Mean, Sd) UCL	88.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.7
95% Approximate Gamma UCL	74.83		
95% Adjusted Gamma UCL	77.23		

Potential UCL to Use		
	Use 95% Student's-t UCL	68.92
	or 95% Modified-t UCL	68.23

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	15.2	Maximum of Log Data	2.721
Mean	10.02	Mean of log Data	1.9
Median	10	SD of log Data	1.677
SD	3.486		
Coefficient of Variation	0.348		
Skewness	-2.173		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.675	Shapiro Wilk Test Statistic	0.389
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.82	95% H-UCL	236
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.34
95% Adjusted-CLT UCL (Chen-1995)	11	97.5% Chebyshev (MVUE) UCL	94.19
95% Modified-t UCL (Johnson-1978)	11.72	99% Chebyshev (MVUE) UCL	137.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.09	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.186		
MLE of Mean	10.02		
MLE of Standard Deviation	9.592		
nu star	26.17		
Approximate Chi Square Value (.05)	15.51	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.67
Adjusted Chi Square Value	14.27	95% Jackknife UCL	11.82
		95% Standard Bootstrap UCL	11.59
Anderson-Darling Test Statistic	3.344	95% Bootstrap-t UCL	11.3
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	11.2
Kolmogorov-Smirnov Test Statistic	0.529	95% Percentile Bootstrap UCL	11.39
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	11.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.4
		97.5% Chebyshev(Mean, Sd) UCL	16.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.03
95% Approximate Gamma UCL	16.9		
95% Adjusted Gamma UCL	18.37		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.03
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	35.2	Minimum of Log Data	3.561
Maximum	40.6	Maximum of Log Data	3.704
Mean	37.9	Mean of log Data	3.635
Median	37.9	SD of log Data	0.0304
SD	1.151		
Coefficient of Variation	0.0304		
Skewness	1.09E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	38.5	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.35
95% Adjusted-CLT UCL (Chen-1995)	38.45	97.5% Chebyshev (MVUE) UCL	39.98
95% Modified-t UCL (Johnson-1978)	38.5	99% Chebyshev (MVUE) UCL	41.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	884.6	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0428		
MLE of Mean	37.9		
MLE of Standard Deviation	1.274		
nu star	21230		
Approximate Chi Square Value (.05)	20893	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	38.45
Adjusted Chi Square Value	20841	95% Jackknife UCL	38.5
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.419	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.35
		97.5% Chebyshev(Mean, Sd) UCL	39.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.21
95% Approximate Gamma UCL	38.51		
95% Adjusted Gamma UCL	38.61		

Potential UCL to Use		
	Use 95% Student's-t UCL	38.5
	or 95% Modified-t UCL	38.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options
From File 194-30.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Arsenic

General Statistics
Number of Valid Observations 13 Number of Distinct Observations 11

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	13.19	Maximum of Log Data	2.579
Mean	8.341	Mean of log Data	2.089
Median	8.341	SD of log Data	0.263
SD	2.23		
Coefficient of Variation	0.267		
Skewness	0.715		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.976
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.443	95% H-UCL	9.645
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.01
95% Adjusted-CLT UCL (Chen-1995)	9.489	97.5% Chebyshev (MVUE) UCL	12.17
95% Modified-t UCL (Johnson-1978)	9.464	99% Chebyshev (MVUE) UCL	14.44

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.17	Data appear Normal at 5% Significance Level	
Theta Star	0.686		
MLE of Mean	8.341		
MLE of Standard Deviation	2.391		
nu star	316.4		
Approximate Chi Square Value (.05)	276.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.358
Adjusted Chi Square Value	270.8	95% Jackknife UCL	9.443
		95% Standard Bootstrap UCL	9.32
Anderson-Darling Test Statistic	0.265	95% Bootstrap-t UCL	9.773
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	9.697
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	9.309
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	9.445
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.04
		97.5% Chebyshev(Mean, Sd) UCL	12.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.49
95% Approximate Gamma UCL	9.555		
95% Adjusted Gamma UCL	9.744		

Potential UCL to Use Use 95% Student's-t UCL 9.443

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	4.8	Maximum of Log Data	1.569
Mean	1.937	Mean of log Data	0.515
Median	1.937	SD of log Data	0.626
SD	1.015		
Coefficient of Variation	0.524		
Skewness	1.638		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.64	Shapiro Wilk Test Statistic	0.668
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.438	95% H-UCL	3.069
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.574
95% Adjusted-CLT UCL (Chen-1995)	2.536	97.5% Chebyshev (MVUE) UCL	4.255
95% Modified-t UCL (Johnson-1978)	2.46	99% Chebyshev (MVUE) UCL	5.592

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.813	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.688		
MLE of Mean	1.937		
MLE of Standard Deviation	1.155		
nu star	73.15		
Approximate Chi Square Value (.05)	54.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	2.4
Adjusted Chi Square Value	52.16	95% Jackknife UCL	2.438
		95% Standard Bootstrap UCL	2.395
Anderson-Darling Test Statistic	2.331	95% Bootstrap-t UCL	2.58
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	5.081
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	2.377
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	2.475
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.163
		97.5% Chebyshev(Mean, Sd) UCL	3.694
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.736
95% Approximate Gamma UCL	2.602		
95% Adjusted Gamma UCL	2.716		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.163

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	37.64	Minimum of Log Data	3.628
Maximum	85	Maximum of Log Data	4.443
Mean	50.97	Mean of log Data	3.909
Median	50.97	SD of log Data	0.211
SD	12.09		
Coefficient of Variation	0.237		
Skewness	1.916		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	56.95	95% H-UCL	57.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	63.95
95% Adjusted-CLT UCL (Chen-1995)	58.39	97.5% Chebyshev (MVUE) UCL	69.6
95% Modified-t UCL (Johnson-1978)	57.25	99% Chebyshev (MVUE) UCL	80.69

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.61	Data appear Gamma Distributed at 5% Significance Le	
Theta Star	2.894		
MLE of Mean	50.97		
MLE of Standard Deviation	12.15		
nu star	457.9		
Approximate Chi Square Value (.05)	409.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	56.49
Adjusted Chi Square Value	402.8	95% Jackknife UCL	56.95
		95% Standard Bootstrap UCL	56.49
Anderson-Darling Test Statistic	0.547	95% Bootstrap-t UCL	59.83
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	84.8
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	56.52
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	58.13
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	65.59
		97.5% Chebyshev(Mean, Sd) UCL	71.91
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	84.33
95% Approximate Gamma UCL	57.03		
95% Adjusted Gamma UCL	57.95		

Potential UCL to Use			
		Use 95% Approximate Gamma UCL	57.03

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	218.9	Minimum of Log Data	5.389
Maximum	1241	Maximum of Log Data	7.123
Mean	485.1	Mean of log Data	6.09
Median	460.5	SD of log Data	0.426
SD	257.2		
Coefficient of Variation	0.53		
Skewness	2.351		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.74	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	612.2	95% H-UCL	620.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	731.5
95% Adjusted-CLT UCL (Chen-1995)	652.1	97.5% Chebyshev (MVUE) UCL	840.5
95% Modified-t UCL (Johnson-1978)	620	99% Chebyshev (MVUE) UCL	1055
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.247	Data appear Gamma Distributed at 5% Significance Le	
Theta Star	114.2		
MLE of Mean	485.1		
MLE of Standard Deviation	235.4		
nu star	110.4		
Approximate Chi Square Value (.05)	87.18	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	602.4
Adjusted Chi Square Value	84.24	95% Jackknife UCL	612.2
		95% Standard Bootstrap UCL	596.7
Anderson-Darling Test Statistic	0.688	95% Bootstrap-t UCL	727.4
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	1182
Kolmogorov-Smirnov Test Statistic	0.212	95% Percentile Bootstrap UCL	606.5
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	646.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	796
		97.5% Chebyshev(Mean, Sd) UCL	930.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1195
95% Approximate Gamma UCL	614.5		
95% Adjusted Gamma UCL	635.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	614.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0271	Minimum of Log Data	-3.608
Maximum	10	Maximum of Log Data	2.303
Mean	7.687	Mean of log Data	1.458
Median	8.8	SD of log Data	1.854
SD	3.513		
Coefficient of Variation	0.457		
Skewness	-1.802		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.665	Shapiro Wilk Test Statistic	0.517
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.423	95% H-UCL	259.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	63.51
95% Adjusted-CLT UCL (Chen-1995)	8.769	97.5% Chebyshev (MVUE) UCL	83.12
95% Modified-t UCL (Johnson-1978)	9.342	99% Chebyshev (MVUE) UCL	121.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.815	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.43		
MLE of Mean	7.687		
MLE of Standard Deviation	8.514		
nu star	21.19		
Approximate Chi Square Value (.05)	11.74	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.289
Adjusted Chi Square Value	10.74	95% Jackknife UCL	9.423
		95% Standard Bootstrap UCL	9.267
Anderson-Darling Test Statistic	3.076	95% Bootstrap-t UCL	8.995
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	8.853
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	9.11
Kolmogorov-Smirnov 5% Critical Value	0.243	95% BCA Bootstrap UCL	8.937
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.93
		97.5% Chebyshev(Mean, Sd) UCL	13.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.38
95% Approximate Gamma UCL	13.88		
95% Adjusted Gamma UCL	15.16		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.38
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	7.2	Minimum of Log Data	1.974
Maximum	69.87	Maximum of Log Data	4.247
Mean	53.76	Mean of log Data	3.823
Median	60.71	SD of log Data	0.739
SD	20.56		
Coefficient of Variation	0.382		
Skewness	-1.884		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.679	Shapiro Wilk Test Statistic	0.569
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.93	95% H-UCL	100.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	113.5
95% Adjusted-CLT UCL (Chen-1995)	59.96	97.5% Chebyshev (MVUE) UCL	137.3
95% Modified-t UCL (Johnson-1978)	63.43	99% Chebyshev (MVUE) UCL	184

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.549	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.09		
MLE of Mean	53.76		
MLE of Standard Deviation	33.67		
nu star	66.29		
Approximate Chi Square Value (.05)	48.55	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	63.14
Adjusted Chi Square Value	46.39	95% Jackknife UCL	63.93
		95% Standard Bootstrap UCL	62.58
Anderson-Darling Test Statistic	2.529	95% Bootstrap-t UCL	61.71
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	60.37
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	62.04
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	60.79
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.62
		97.5% Chebyshev(Mean, Sd) UCL	89.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.5
95% Approximate Gamma UCL	73.4		
95% Adjusted Gamma UCL	76.82		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	78.62
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	10.38	Maximum of Log Data	2.34
Mean	8.386	Mean of log Data	1.743
Median	9.76	SD of log Data	1.597
SD	3.023		
Coefficient of Variation	0.36		
Skewness	-2.261		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.644	Shapiro Wilk Test Statistic	0.407
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.88	95% H-UCL	127.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	53.79
95% Adjusted-CLT UCL (Chen-1995)	9.203	97.5% Chebyshev (MVUE) UCL	69.68
95% Modified-t UCL (Johnson-1978)	9.793	99% Chebyshev (MVUE) UCL	100.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.165	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.196		
MLE of Mean	8.386		
MLE of Standard Deviation	7.768		
nu star	30.3		
Approximate Chi Square Value (.05)	18.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.765
Adjusted Chi Square Value	17.44	95% Jackknife UCL	9.88
		95% Standard Bootstrap UCL	9.725
Anderson-Darling Test Statistic	3.243	95% Bootstrap-t UCL	9.491
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	9.353
Kolmogorov-Smirnov Test Statistic	0.456	95% Percentile Bootstrap UCL	9.58
Kolmogorov-Smirnov 5% Critical Value	0.241	95% BCA Bootstrap UCL	9.378
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.04
		97.5% Chebyshev(Mean, Sd) UCL	13.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.73
95% Approximate Gamma UCL	13.57		
95% Adjusted Gamma UCL	14.57		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	16.73
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	16.8	Minimum of Log Data	2.821
Maximum	37	Maximum of Log Data	3.611
Mean	25.8	Mean of log Data	3.238
Median	25.8	SD of log Data	0.163
SD	4.196		
Coefficient of Variation	0.163		
Skewness	0.887		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.632	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27.87	95% H-UCL	28.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.91
95% Adjusted-CLT UCL (Chen-1995)	28.02	97.5% Chebyshev (MVUE) UCL	33.13
95% Modified-t UCL (Johnson-1978)	27.92	99% Chebyshev (MVUE) UCL	37.47

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	31.91	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.809		
MLE of Mean	25.8		
MLE of Standard Deviation	4.567		
nu star	829.6		
Approximate Chi Square Value (.05)	763.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	27.71
Adjusted Chi Square Value	754.8	95% Jackknife UCL	27.87
		95% Standard Bootstrap UCL	27.66
Anderson-Darling Test Statistic	2.546	95% Bootstrap-t UCL	28.01
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	30.1
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	27.69
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	27.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.87
		97.5% Chebyshev(Mean, Sd) UCL	33.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.38
95% Approximate Gamma UCL	28.02		
95% Adjusted Gamma UCL	28.36		

Potential UCL to Use			
		Use 95% Student's-t UCL	27.87
		or 95% Modified-t UCL	27.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-01.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Antimony

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	32.65	Minimum of Log Data	3.486
Maximum	85	Maximum of Log Data	4.443
Mean	71.97	Mean of log Data	4.212
Median	85	SD of log Data	0.398
SD	22.45		
Coefficient of Variation	0.312		
Skewness	-1.183		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.572	Shapiro Wilk Test Statistic	0.581
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	80.9	95% H-UCL	87.48
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.4
95% Adjusted-CLT UCL (Chen-1995)	78.94	97.5% Chebyshev (MVUE) UCL	115.2
95% Modified-t UCL (Johnson-1978)	80.66	99% Chebyshev (MVUE) UCL	140.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.734	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.69		
MLE of Mean	71.97		
MLE of Standard Deviation	27.73		
nu star	255.9		
Approximate Chi Square Value (.05)	219.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	80.44
Adjusted Chi Square Value	217	95% Jackknife UCL	80.9
		95% Standard Bootstrap UCL	79.87
Anderson-Darling Test Statistic	4.226	95% Bootstrap-t UCL	79.15
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	78.44
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	79.81
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	79.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.41
		97.5% Chebyshev(Mean, Sd) UCL	104.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	123.2
95% Approximate Gamma UCL	83.76		
95% Adjusted Gamma UCL	84.89		

Potential UCL to Use		
	Use 95% Student's-t UCL	80.9
	or 95% Modified-t UCL	80.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0247	Minimum of Log Data	-3.701
Maximum	10	Maximum of Log Data	2.303
Mean	9.302	Mean of log Data	1.966
Median	10	SD of log Data	1.375
SD	2.37		
Coefficient of Variation	0.255		
Skewness	-3.78		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.34	Shapiro Wilk Test Statistic	0.267
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.24	95% H-UCL	51.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	44.03
95% Adjusted-CLT UCL (Chen-1995)	9.692	97.5% Chebyshev (MVUE) UCL	55.78
95% Modified-t UCL (Johnson-1978)	10.17	99% Chebyshev (MVUE) UCL	78.87

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.754	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.305		
MLE of Mean	9.302		
MLE of Standard Deviation	7.024		
nu star	66.63		
Approximate Chi Square Value (.05)	48.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	10.2
Adjusted Chi Square Value	47.52	95% Jackknife UCL	10.24
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	6.574	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.527	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.67
		97.5% Chebyshev(Mean, Sd) UCL	12.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.71
95% Approximate Gamma UCL	12.69		
95% Adjusted Gamma UCL	13.04		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 95% Chebyshev (Mean, Sd) UCL	11.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	7.5	Minimum of Log Data	2.015
Maximum	65	Maximum of Log Data	4.174
Mean	61.63	Mean of log Data	4.055
Median	65	SD of log Data	0.495
SD	13.19		
Coefficient of Variation	0.214		
Skewness	-4.27		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.283	Shapiro Wilk Test Statistic	0.261
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.88	95% H-UCL	82.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.88
95% Adjusted-CLT UCL (Chen-1995)	63.44	97.5% Chebyshev (MVUE) UCL	112.2
95% Modified-t UCL (Johnson-1978)	66.38	99% Chebyshev (MVUE) UCL	140.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.553	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.405		
MLE of Mean	61.63		
MLE of Standard Deviation	24.08		
nu star	249		
Approximate Chi Square Value (.05)	213.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	66.61
Adjusted Chi Square Value	210.6	95% Jackknife UCL	66.88
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	6.527	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.501	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.199	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.82
		97.5% Chebyshev(Mean, Sd) UCL	80.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	91.74
95% Approximate Gamma UCL	71.89		
95% Adjusted Gamma UCL	72.87		

Potential UCL to Use		
	Use 95% Student's-t UCL	66.88
	or 95% Modified-t UCL	66.38

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	19	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	10.93	Maximum of Log Data	2.392
Mean	9.524	Mean of log Data	2.013
Median	10	SD of log Data	1.286
SD	2.307		
Coefficient of Variation	0.242		
Skewness	-4.293		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.287	Shapiro Wilk Test Statistic	0.251
Shapiro Wilk Critical Value	0.901	Shapiro Wilk Critical Value	0.901
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.44	95% H-UCL	42.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.65
95% Adjusted-CLT UCL (Chen-1995)	9.838	97.5% Chebyshev (MVUE) UCL	49.92
95% Modified-t UCL (Johnson-1978)	10.36	99% Chebyshev (MVUE) UCL	70.09

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.908	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.991		
MLE of Mean	9.524		
MLE of Standard Deviation	6.895		
nu star	72.51		
Approximate Chi Square Value (.05)	53.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	10.39
Adjusted Chi Square Value	52.5	95% Jackknife UCL	10.44
		95% Standard Bootstrap UCL	10.38
Anderson-Darling Test Statistic	6.973	95% Bootstrap-t UCL	10.17
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	10.06
Kolmogorov-Smirnov Test Statistic	0.564	95% Percentile Bootstrap UCL	10.1
Kolmogorov-Smirnov 5% Critical Value	0.201	95% BCA Bootstrap UCL	10.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.83
		97.5% Chebyshev(Mean, Sd) UCL	12.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.79
95% Approximate Gamma UCL	12.81		
95% Adjusted Gamma UCL	13.15		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.83
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-02.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	31.23	Minimum of Log Data	3.441
Maximum	85	Maximum of Log Data	4.443
Mean	67.4	Mean of log Data	4.163
Median	67.4	SD of log Data	0.341
SD	19.66		
Coefficient of Variation	0.292		
Skewness	-0.652		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.822
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	77.11	95% H-UCL	82.42
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.01
95% Adjusted-CLT UCL (Chen-1995)	75.31	97.5% Chebyshev (MVUE) UCL	108.2
95% Modified-t UCL (Johnson-1978)	76.95	99% Chebyshev (MVUE) UCL	132.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.174	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.246		
MLE of Mean	67.4		
MLE of Standard Deviation	23.57		
nu star	212.5		
Approximate Chi Square Value (.05)	179.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	76.36
Adjusted Chi Square Value	175.5	95% Jackknife UCL	77.11
		95% Standard Bootstrap UCL	75.95
Anderson-Darling Test Statistic	0.925	95% Bootstrap-t UCL	76.43
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	75
Kolmogorov-Smirnov Test Statistic	0.273	95% Percentile Bootstrap UCL	75.93
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	74.96
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.16
		97.5% Chebyshev(Mean, Sd) UCL	101.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	121.6
95% Approximate Gamma UCL	79.67		
95% Adjusted Gamma UCL	81.62		

Potential UCL to Use		
	Use 95% Student's-t UCL	77.11
	or 95% Modified-t UCL	76.95

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	13.91	Maximum of Log Data	2.633
Mean	9.452	Mean of log Data	1.926
Median	10	SD of log Data	1.427
SD	3.038		
Coefficient of Variation	0.321		
Skewness	-2.592		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.54	Shapiro Wilk Test Statistic	0.356
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.95	95% H-UCL	85.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.45
95% Adjusted-CLT UCL (Chen-1995)	10.19	97.5% Chebyshev (MVUE) UCL	62.22
95% Modified-t UCL (Johnson-1978)	10.85	99% Chebyshev (MVUE) UCL	89.27

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.365	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.924		
MLE of Mean	9.452		
MLE of Standard Deviation	8.09		
nu star	35.49		
Approximate Chi Square Value (.05)	22.86	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.84
Adjusted Chi Square Value	21.43	95% Jackknife UCL	10.95
		95% Standard Bootstrap UCL	10.81
Anderson-Darling Test Statistic	4.009	95% Bootstrap-t UCL	10.44
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	10.33
Kolmogorov-Smirnov Test Statistic	0.525	95% Percentile Bootstrap UCL	10.56
Kolmogorov-Smirnov 5% Critical Value	0.24	95% BCA Bootstrap UCL	10.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.13
		97.5% Chebyshev(Mean, Sd) UCL	14.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.84
95% Approximate Gamma UCL	14.67		
95% Adjusted Gamma UCL	15.66		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	13.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	4.25	Minimum of Log Data	1.447
Maximum	33.64	Maximum of Log Data	3.516
Mean	19.81	Mean of log Data	2.915
Median	20	SD of log Data	0.464
SD	6.012		
Coefficient of Variation	0.304		
Skewness	-0.507		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.58	Shapiro Wilk Test Statistic	0.48
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.78	95% H-UCL	27.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	32.05
95% Adjusted-CLT UCL (Chen-1995)	22.3	97.5% Chebyshev (MVUE) UCL	37.11
95% Modified-t UCL (Johnson-1978)	22.74	99% Chebyshev (MVUE) UCL	47.04

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.595	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.541		
MLE of Mean	19.81		
MLE of Standard Deviation	8.375		
nu star	145.5		
Approximate Chi Square Value (.05)	118.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	22.55
Adjusted Chi Square Value	115.1	95% Jackknife UCL	22.78
		95% Standard Bootstrap UCL	22.54
Anderson-Darling Test Statistic	3.22	95% Bootstrap-t UCL	22.13
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	22.72
Kolmogorov-Smirnov Test Statistic	0.473	95% Percentile Bootstrap UCL	22.1
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	22.05
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	27.08
		97.5% Chebyshev(Mean, Sd) UCL	30.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	36.4
95% Approximate Gamma UCL	24.3		
95% Adjusted Gamma UCL	25.03		

Potential UCL to Use		
	Use 95% Student's-t UCL	22.78
	or 95% Modified-t UCL	22.74

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-03.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Antimony

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	7.2	Minimum of Log Data	1.974
Maximum	28.55	Maximum of Log Data	3.352
Mean	12.77	Mean of log Data	2.508
Median	12.77	SD of log Data	0.272
SD	4.417		
Coefficient of Variation	0.346		
Skewness	3.036		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.613	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.64	95% H-UCL	14.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.4
95% Adjusted-CLT UCL (Chen-1995)	15.38	97.5% Chebyshev (MVUE) UCL	18
95% Modified-t UCL (Johnson-1978)	14.78	99% Chebyshev (MVUE) UCL	21.14

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.217		
MLE of Mean	12.77		
MLE of Standard Deviation	3.943		
nu star	356.8		
Approximate Chi Square Value (.05)	314	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	14.54
Adjusted Chi Square Value	309.8	95% Jackknife UCL	14.64
		95% Standard Bootstrap UCL	14.49
Anderson-Darling Test Statistic	1.844	95% Bootstrap-t UCL	16.36
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	22.86
Kolmogorov-Smirnov Test Statistic	0.345	95% Percentile Bootstrap UCL	14.83
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	15.45
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.44
		97.5% Chebyshev(Mean, Sd) UCL	19.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.43
95% Approximate Gamma UCL	14.51		
95% Adjusted Gamma UCL	14.71		

Potential UCL to Use		
	Use 95% Student's-t UCL	14.64
	or 95% Modified-t UCL	14.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	15.6	Minimum of Log Data	2.747
Maximum	85	Maximum of Log Data	4.443
Mean	61.31	Mean of log Data	4.042
Median	61.31	SD of log Data	0.44
SD	20.43		
Coefficient of Variation	0.333		
Skewness	-0.608		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.777
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.96	95% H-UCL	77.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.11
95% Adjusted-CLT UCL (Chen-1995)	68.68	97.5% Chebyshev (MVUE) UCL	105
95% Modified-t UCL (Johnson-1978)	69.84	99% Chebyshev (MVUE) UCL	130.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.765	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.64		
MLE of Mean	61.31		
MLE of Standard Deviation	25.54		
nu star	196		
Approximate Chi Square Value (.05)	164.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	69.46
Adjusted Chi Square Value	161.6	95% Jackknife UCL	69.96
		95% Standard Bootstrap UCL	69.18
Anderson-Darling Test Statistic	1.264	95% Bootstrap-t UCL	69.44
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	68.93
Kolmogorov-Smirnov Test Statistic	0.315	95% Percentile Bootstrap UCL	68.51
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	68.47
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.91
		97.5% Chebyshev(Mean, Sd) UCL	92.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.6
95% Approximate Gamma UCL	73		
95% Adjusted Gamma UCL	74.36		

Potential UCL to Use		
	Use 95% Student's-t UCL	69.96
	or 95% Modified-t UCL	69.84

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	12.5	Minimum of Log Data	2.526
Maximum	66.58	Maximum of Log Data	4.198
Mean	58.82	Mean of log Data	4.027
Median	58.82	SD of log Data	0.39
SD	12.34		
Coefficient of Variation	0.21		
Skewness	-3.673		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.469	Shapiro Wilk Test Statistic	0.365
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.04	95% H-UCL	73.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.64
95% Adjusted-CLT UCL (Chen-1995)	60.89	97.5% Chebyshev (MVUE) UCL	96.63
95% Modified-t UCL (Johnson-1978)	63.6	99% Chebyshev (MVUE) UCL	118.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.918	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.595		
MLE of Mean	58.82		
MLE of Standard Deviation	19.7		
nu star	303.2		
Approximate Chi Square Value (.05)	263.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	63.74
Adjusted Chi Square Value	260	95% Jackknife UCL	64.04
		95% Standard Bootstrap UCL	63.54
Anderson-Darling Test Statistic	4.232	95% Bootstrap-t UCL	62.36
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	61.85
Kolmogorov-Smirnov Test Statistic	0.482	95% Percentile Bootstrap UCL	62.55
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	61.91
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	71.87
		97.5% Chebyshev(Mean, Sd) UCL	77.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	88.6
95% Approximate Gamma UCL	67.59		
95% Adjusted Gamma UCL	68.58		

Potential UCL to Use		
	Use 95% Student's-t UCL	64.04
	or 95% Modified-t UCL	63.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.037	Minimum of Log Data	-3.297
Maximum	0.041	Maximum of Log Data	-3.194
Mean	0.039	Mean of log Data	-3.244
Median	0.039	SD of log Data	0.0182
SD	7.07E-04		
Coefficient of Variation	0.0181		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.494	Shapiro Wilk Test Statistic	0.493
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0393	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0397
95% Adjusted-CLT UCL (Chen-1995)	0.0393	97.5% Chebyshev (MVUE) UCL	0.0401
95% Modified-t UCL (Johnson-1978)	0.0393	99% Chebyshev (MVUE) UCL	0.0407

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2658	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.47E-05		
MLE of Mean	0.039		
MLE of Standard Deviation	7.56E-04		
nu star	90386		
Approximate Chi Square Value (.05)	89688	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.0393
Adjusted Chi Square Value	89615	95% Jackknife UCL	0.0393
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.627	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.478	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0397
		97.5% Chebyshev(Mean, Sd) UCL	0.0401
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0407
95% Approximate Gamma UCL	0.0393		
95% Adjusted Gamma UCL	0.0393		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0393
	or 95% Modified-t UCL	0.0393

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.25	Minimum of Log Data	0.223
Maximum	1.31	Maximum of Log Data	0.27
Mean	1.28	Mean of log Data	0.247
Median	1.28	SD of log Data	0.00829
SD	0.0106		
Coefficient of Variation	0.00829		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.494	Shapiro Wilk Test Statistic	0.494
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.284	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.291
95% Adjusted-CLT UCL (Chen-1995)	1.284	97.5% Chebyshev (MVUE) UCL	1.296
95% Modified-t UCL (Johnson-1978)	1.284	99% Chebyshev (MVUE) UCL	1.306

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12740	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.00E-04		
MLE of Mean	1.28		
MLE of Standard Deviation	0.0113		
nu star	433153		
Approximate Chi Square Value (.05)	431623	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	1.284
Adjusted Chi Square Value	431463	95% Jackknife UCL	1.284
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	7.41	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.65	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.208	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.291
		97.5% Chebyshev(Mean, Sd) UCL	1.296
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.306
95% Approximate Gamma UCL	1.285		
95% Adjusted Gamma UCL	1.285		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.284
	or 95% Modified-t UCL	1.284

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	194-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	9.3	Minimum of Log Data	2.23
Maximum	85	Maximum of Log Data	4.443
Mean	75.9	Mean of log Data	4.248
Median	85	SD of log Data	0.514
SD	21.23		
Coefficient of Variation	0.28		
Skewness	-2.232		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.495	Shapiro Wilk Test Statistic	0.449
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	83.5	95% H-UCL	99.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	118
95% Adjusted-CLT UCL (Chen-1995)	80.98	97.5% Chebyshev (MVUE) UCL	134.7
95% Modified-t UCL (Johnson-1978)	83.15	99% Chebyshev (MVUE) UCL	167.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.498	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.8		
MLE of Mean	75.9		
MLE of Standard Deviation	32.37		
nu star	252.9		
Approximate Chi Square Value (.05)	217.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	83.18
Adjusted Chi Square Value	214.7	95% Jackknife UCL	83.5
		95% Standard Bootstrap UCL	82.88
Anderson-Darling Test Statistic	5.695	95% Bootstrap-t UCL	81.63
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	81.43
Kolmogorov-Smirnov Test Statistic	0.489	95% Percentile Bootstrap UCL	81.82
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	81.11
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.19
		97.5% Chebyshev(Mean, Sd) UCL	103.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	119.9
95% Approximate Gamma UCL	88.42		
95% Adjusted Gamma UCL	89.41		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	95.19
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0248	Minimum of Log Data	-3.697
Maximum	10	Maximum of Log Data	2.303
Mean	9.519	Mean of log Data	2.037
Median	10	SD of log Data	1.25
SD	2.082		
Coefficient of Variation	0.219		
Skewness	-4.71		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.249	Shapiro Wilk Test Statistic	0.222
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.26	95% H-UCL	36.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	37.04
95% Adjusted-CLT UCL (Chen-1995)	9.778	97.5% Chebyshev (MVUE) UCL	46.22
95% Modified-t UCL (Johnson-1978)	10.19	99% Chebyshev (MVUE) UCL	64.24

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	2.17	Data do not follow a Discernable Distribution (0.05)		
Theta Star	4.386			
MLE of Mean	9.519			
MLE of Standard Deviation	6.461			
nu star	99.84			
Approximate Chi Square Value (.05)	77.79	Nonparametric Statistics		
Adjusted Level of Significance	0.0389	95% CLT UCL		10.23
Adjusted Chi Square Value	76.38	95% Jackknife UCL		10.26
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	8.537	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.528	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		11.41
		97.5% Chebyshev(Mean, Sd) UCL		12.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		13.84
95% Approximate Gamma UCL	12.22			
95% Adjusted Gamma UCL	12.44			

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	11.41
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	55.68	Minimum of Log Data	4.02
Maximum	91.72	Maximum of Log Data	4.519
Mean	66.54	Mean of log Data	4.193
Median	65	SD of log Data	0.0962
SD	7.052		
Coefficient of Variation	0.106		
Skewness	2.493		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.575	Shapiro Wilk Test Statistic	0.609
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.06	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.35
95% Adjusted-CLT UCL (Chen-1995)	69.77	97.5% Chebyshev (MVUE) UCL	74.87
95% Modified-t UCL (Johnson-1978)	69.19	99% Chebyshev (MVUE) UCL	79.82

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	92.44	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.72		
MLE of Mean	66.54		
MLE of Standard Deviation	6.92		
nu star	4252		
Approximate Chi Square Value (.05)	4102	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	68.96
Adjusted Chi Square Value	4091	95% Jackknife UCL	69.06
		95% Standard Bootstrap UCL	68.87
Anderson-Darling Test Statistic	4.596	95% Bootstrap-t UCL	71.68
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	83.84
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	69.19
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	69.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.95
		97.5% Chebyshev(Mean, Sd) UCL	75.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	81.17
95% Approximate Gamma UCL	68.98		
95% Adjusted Gamma UCL	69.16		

Potential UCL to Use		
	Use 95% Student's-t UCL	69.06
	or 95% Modified-t UCL	69.19

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.039	Minimum of Log Data	-3.244
Maximum	12.35	Maximum of Log Data	2.514
Mean	9.775	Mean of log Data	2.081
Median	10	SD of log Data	1.162
SD	2.204		
Coefficient of Variation	0.225		
Skewness	-4.178		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.372	Shapiro Wilk Test Statistic	0.242
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.56	95% H-UCL	31.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.47
95% Adjusted-CLT UCL (Chen-1995)	10.1	97.5% Chebyshev (MVUE) UCL	41.44
95% Modified-t UCL (Johnson-1978)	10.5	99% Chebyshev (MVUE) UCL	57.11

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.345	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.168		
MLE of Mean	9.775		
MLE of Standard Deviation	6.383		
nu star	107.9		
Approximate Chi Square Value (.05)	84.91	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.53
Adjusted Chi Square Value	83.44	95% Jackknife UCL	10.56
		95% Standard Bootstrap UCL	10.51
Anderson-Darling Test Statistic	7.82	95% Bootstrap-t UCL	10.31
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	10.23
Kolmogorov-Smirnov Test Statistic	0.552	95% Percentile Bootstrap UCL	10.35
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	10.28
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.78
		97.5% Chebyshev(Mean, Sd) UCL	12.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.35
95% Approximate Gamma UCL	12.42		
95% Adjusted Gamma UCL	12.64		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	194-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	85	Maximum of Log Data	4.443
Mean	70.05	Mean of log Data	4.143
Median	85	SD of log Data	0.57
SD	24.42		
Coefficient of Variation	0.349		
Skewness	-1.281		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.649	Shapiro Wilk Test Statistic	0.595
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	79.5	95% H-UCL	97.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.1
95% Adjusted-CLT UCL (Chen-1995)	77.36	97.5% Chebyshev (MVUE) UCL	134.5
95% Modified-t UCL (Johnson-1978)	79.23	99% Chebyshev (MVUE) UCL	170.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.153	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.87		
MLE of Mean	70.05		
MLE of Standard Deviation	34.38		
nu star	166.1		
Approximate Chi Square Value (.05)	137.3	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	79.04
Adjusted Chi Square Value	135.2	95% Jackknife UCL	79.5
		95% Standard Bootstrap UCL	78.81
Anderson-Darling Test Statistic	3.337	95% Bootstrap-t UCL	78.12
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	77.27
Kolmogorov-Smirnov Test Statistic	0.422	95% Percentile Bootstrap UCL	78.33
Kolmogorov-Smirnov 5% Critical Value	0.194	95% BCA Bootstrap UCL	77.27
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	93.85
		97.5% Chebyshev(Mean, Sd) UCL	104.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124.4
95% Approximate Gamma UCL	84.75		
95% Adjusted Gamma UCL	86.04		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	93.85
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0271	Minimum of Log Data	-3.608
Maximum	10	Maximum of Log Data	2.303
Mean	9.436	Mean of log Data	2
Median	10	SD of log Data	1.32
SD	2.234		
Coefficient of Variation	0.237		
Skewness	-4.355		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.279	Shapiro Wilk Test Statistic	0.244
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.3	95% H-UCL	45.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.17
95% Adjusted-CLT UCL (Chen-1995)	9.738	97.5% Chebyshev (MVUE) UCL	51.87
95% Modified-t UCL (Johnson-1978)	10.22	99% Chebyshev (MVUE) UCL	72.91

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.901	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.964		
MLE of Mean	9.436		
MLE of Standard Deviation	6.844		
nu star	76.04		
Approximate Chi Square Value (.05)	56.95	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	10.26
Adjusted Chi Square Value	55.65	95% Jackknife UCL	10.3
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	7.311	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.523	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.196	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.61
		97.5% Chebyshev(Mean, Sd) UCL	12.56
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.41
95% Approximate Gamma UCL	12.6		
95% Adjusted Gamma UCL	12.89		

Potential UCL to Use		
Recommended UCL exceeds the maximum observation	Use 95% Chebyshev (Mean, Sd) UCL	11.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	75.64	Maximum of Log Data	4.326
Mean	62.34	Mean of log Data	4.062
Median	65	SD of log Data	0.521
SD	13.44		
Coefficient of Variation	0.216		
Skewness	-4.152		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.346	Shapiro Wilk Test Statistic	0.278
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.54	95% H-UCL	84.86
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	100.8
95% Adjusted-CLT UCL (Chen-1995)	64.31	97.5% Chebyshev (MVUE) UCL	115.9
95% Modified-t UCL (Johnson-1978)	67.08	99% Chebyshev (MVUE) UCL	145.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.179	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.09		
MLE of Mean	62.34		
MLE of Standard Deviation	25.08		
nu star	247.2		
Approximate Chi Square Value (.05)	211.8	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	67.29
Adjusted Chi Square Value	209.2	95% Jackknife UCL	67.54
		95% Standard Bootstrap UCL	67.21
Anderson-Darling Test Statistic	6.49	95% Bootstrap-t UCL	66.14
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	65.58
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	66.06
Kolmogorov-Smirnov 5% Critical Value	0.194	95% BCA Bootstrap UCL	65.53
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.44
		97.5% Chebyshev(Mean, Sd) UCL	81.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	92.25
95% Approximate Gamma UCL	72.76		
95% Adjusted Gamma UCL	73.66		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	75.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.048	Minimum of Log Data	-3.037
Maximum	15.49	Maximum of Log Data	2.74
Mean	9.884	Mean of log Data	2.068
Median	10	SD of log Data	1.206
SD	2.632		
Coefficient of Variation	0.266		
Skewness	-2.472		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.481	Shapiro Wilk Test Statistic	0.283
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.9	95% H-UCL	36.92
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.37
95% Adjusted-CLT UCL (Chen-1995)	10.5	97.5% Chebyshev (MVUE) UCL	45.43
95% Modified-t UCL (Johnson-1978)	10.85	99% Chebyshev (MVUE) UCL	63.22

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.067	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.782		
MLE of Mean	9.884		
MLE of Standard Deviation	6.875		
nu star	82.67		
Approximate Chi Square Value (.05)	62.72	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	10.85
Adjusted Chi Square Value	61.35	95% Jackknife UCL	10.9
		95% Standard Bootstrap UCL	10.81
Anderson-Darling Test Statistic	6.332	95% Bootstrap-t UCL	10.62
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	10.6
Kolmogorov-Smirnov Test Statistic	0.543	95% Percentile Bootstrap UCL	10.73
Kolmogorov-Smirnov 5% Critical Value	0.196	95% BCA Bootstrap UCL	10.55
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.45
		97.5% Chebyshev(Mean, Sd) UCL	13.56
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.74
95% Approximate Gamma UCL	13.03		
95% Adjusted Gamma UCL	13.32		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	12.45

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-06.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	14	Minimum of Log Data	2.639
Maximum	85	Maximum of Log Data	4.443
Mean	70.13	Mean of log Data	4.159
Median	77.56	SD of log Data	0.533
SD	22.51		
Coefficient of Variation	0.321		
Skewness	-1.849		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.701	Shapiro Wilk Test Statistic	0.594
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	81.8	95% H-UCL	104.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	123
95% Adjusted-CLT UCL (Chen-1995)	77.11	97.5% Chebyshev (MVUE) UCL	144.7
95% Modified-t UCL (Johnson-1978)	81.22	99% Chebyshev (MVUE) UCL	187.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.282	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.38		
MLE of Mean	70.13		
MLE of Standard Deviation	33.89		
nu star	102.8		
Approximate Chi Square Value (.05)	80.37	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	80.82
Adjusted Chi Square Value	77.35	95% Jackknife UCL	81.8
		95% Standard Bootstrap UCL	80.61
Anderson-Darling Test Statistic	1.932	95% Bootstrap-t UCL	78.97
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	77.88
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	79.76
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	77.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.45
		97.5% Chebyshev(Mean, Sd) UCL	110.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.8
95% Approximate Gamma UCL	89.66		
95% Adjusted Gamma UCL	93.16		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	98.45
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	118.8	Minimum of Log Data	4.778
Maximum	2807	Maximum of Log Data	7.94
Mean	658.1	Mean of log Data	6.127
Median	530.4	SD of log Data	0.854
SD	719.1		
Coefficient of Variation	1.093		
Skewness	2.783		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.642	Shapiro Wilk Test Statistic	0.947
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1031	95% H-UCL	1308
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1355
95% Adjusted-CLT UCL (Chen-1995)	1178	97.5% Chebyshev (MVUE) UCL	1667
95% Modified-t UCL (Johnson-1978)	1059	99% Chebyshev (MVUE) UCL	2279

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.199	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	548.8		
MLE of Mean	658.1		
MLE of Standard Deviation	601		
nu star	28.78		
Approximate Chi Square Value (.05)	17.54	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	999.5
Adjusted Chi Square Value	16.21	95% Jackknife UCL	1031
		95% Standard Bootstrap UCL	981.3
Anderson-Darling Test Statistic	0.564	95% Bootstrap-t UCL	1533
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	2409
Kolmogorov-Smirnov Test Statistic	0.226	95% Percentile Bootstrap UCL	1007
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	1259
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1563
		97.5% Chebyshev(Mean, Sd) UCL	1954
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2723
95% Approximate Gamma UCL	1080		
95% Adjusted Gamma UCL	1168		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1080

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	10.1	Minimum of Log Data	2.313
Maximum	80.6	Maximum of Log Data	4.389
Mean	61.63	Mean of log Data	4.034
Median	65	SD of log Data	0.549
SD	17.37		
Coefficient of Variation	0.282		
Skewness	-2.622		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.623	Shapiro Wilk Test Statistic	0.462
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.63	95% H-UCL	94.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.8
95% Adjusted-CLT UCL (Chen-1995)	65.82	97.5% Chebyshev (MVUE) UCL	130.7
95% Modified-t UCL (Johnson-1978)	70	99% Chebyshev (MVUE) UCL	169.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.475	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.77		
MLE of Mean	61.63		
MLE of Standard Deviation	29.13		
nu star	107.4		
Approximate Chi Square Value (.05)	84.48	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.88
Adjusted Chi Square Value	81.38	95% Jackknife UCL	70.63
		95% Standard Bootstrap UCL	69.64
Anderson-Darling Test Statistic	2.688	95% Bootstrap-t UCL	67.91
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	67.01
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	68.07
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	67.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.49
		97.5% Chebyshev(Mean, Sd) UCL	92.94
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111.5
95% Approximate Gamma UCL	78.35		
95% Adjusted Gamma UCL	81.33		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	83.49

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.035	Minimum of Log Data	-3.352
Maximum	10	Maximum of Log Data	2.303
Mean	8.741	Mean of log Data	1.786
Median	9.945	SD of log Data	1.619
SD	2.806		
Coefficient of Variation	0.321		
Skewness	-3.19		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.486	Shapiro Wilk Test Statistic	0.356
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.2	95% H-UCL	167.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.46
95% Adjusted-CLT UCL (Chen-1995)	9.276	97.5% Chebyshev (MVUE) UCL	75.94
95% Modified-t UCL (Johnson-1978)	10.07	99% Chebyshev (MVUE) UCL	110.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.144	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.639		
MLE of Mean	8.741		
MLE of Standard Deviation	8.171		
nu star	27.46		
Approximate Chi Square Value (.05)	16.51	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.07
Adjusted Chi Square Value	15.23	95% Jackknife UCL	10.2
		95% Standard Bootstrap UCL	10.03
Anderson-Darling Test Statistic	3.771	95% Bootstrap-t UCL	9.666
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	9.523
Kolmogorov-Smirnov Test Statistic	0.527	95% Percentile Bootstrap UCL	9.685
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	9.571
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.27
		97.5% Chebyshev(Mean, Sd) UCL	13.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.8
95% Approximate Gamma UCL	14.54		
95% Adjusted Gamma UCL	15.76		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	16.8
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-07.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	11.4	Minimum of Log Data	2.434
Maximum	85	Maximum of Log Data	4.443
Mean	68.17	Mean of log Data	4.126
Median	85	SD of log Data	0.535
SD	23.29		
Coefficient of Variation	0.342		
Skewness	-1.213		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.758	Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	78.37	95% H-UCL	95.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	113.5
95% Adjusted-CLT UCL (Chen-1995)	75.86	97.5% Chebyshev (MVUE) UCL	132
95% Modified-t UCL (Johnson-1978)	78.08	99% Chebyshev (MVUE) UCL	168.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.398	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.5		
MLE of Mean	68.17		
MLE of Standard Deviation	32.5		
nu star	140.7		
Approximate Chi Square Value (.05)	114.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	77.74
Adjusted Chi Square Value	111.6	95% Jackknife UCL	78.37
		95% Standard Bootstrap UCL	77.34
Anderson-Darling Test Statistic	1.853	95% Bootstrap-t UCL	77.31
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	76.11
Kolmogorov-Smirnov Test Statistic	0.312	95% Percentile Bootstrap UCL	76.86
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	76.41
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	93.54
		97.5% Chebyshev(Mean, Sd) UCL	104.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.1
95% Approximate Gamma UCL	83.91		
95% Adjusted Gamma UCL	85.95		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	93.54
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	7.9	Minimum of Log Data	2.067
Maximum	77.14	Maximum of Log Data	4.346
Mean	61.79	Mean of log Data	4.047
Median	65	SD of log Data	0.53
SD	14.75		
Coefficient of Variation	0.239		
Skewness	-3.62		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.417	Shapiro Wilk Test Statistic	0.331
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.25	95% H-UCL	87.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.2
95% Adjusted-CLT UCL (Chen-1995)	64.29	97.5% Chebyshev (MVUE) UCL	121.1
95% Modified-t UCL (Johnson-1978)	67.7	99% Chebyshev (MVUE) UCL	154.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.471	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.29		
MLE of Mean	61.79		
MLE of Standard Deviation	26.42		
nu star	175.1		
Approximate Chi Square Value (.05)	145.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	67.85
Adjusted Chi Square Value	142.4	95% Jackknife UCL	68.25
		95% Standard Bootstrap UCL	67.76
Anderson-Darling Test Statistic	4.847	95% Bootstrap-t UCL	66.28
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	65.53
Kolmogorov-Smirnov Test Statistic	0.489	95% Percentile Bootstrap UCL	66.32
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	65.71
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.86
		97.5% Chebyshev(Mean, Sd) UCL	84.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	98.48
95% Approximate Gamma UCL	74.36		
95% Adjusted Gamma UCL	75.96		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	77.86
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	13.53	Maximum of Log Data	2.605
Mean	9.564	Mean of log Data	1.963
Median	10	SD of log Data	1.427
SD	2.698		
Coefficient of Variation	0.282		
Skewness	-3.109		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.473	Shapiro Wilk Test Statistic	0.307
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.75	95% H-UCL	69.37
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.13
95% Adjusted-CLT UCL (Chen-1995)	10.11	97.5% Chebyshev (MVUE) UCL	62.76
95% Modified-t UCL (Johnson-1978)	10.66	99% Chebyshev (MVUE) UCL	89.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.539	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.216		
MLE of Mean	9.564		
MLE of Standard Deviation	7.71		
nu star	49.23		
Approximate Chi Square Value (.05)	34.13	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.67
Adjusted Chi Square Value	32.7	95% Jackknife UCL	10.75
		95% Standard Bootstrap UCL	10.68
Anderson-Darling Test Statistic	5.236	95% Bootstrap-t UCL	10.4
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	10.27
Kolmogorov-Smirnov Test Statistic	0.535	95% Percentile Bootstrap UCL	10.44
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	10.27
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.5
		97.5% Chebyshev(Mean, Sd) UCL	13.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.28
95% Approximate Gamma UCL	13.8		
95% Adjusted Gamma UCL	14.4		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	12.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-08.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	11	Minimum of Log Data	2.398
Maximum	85	Maximum of Log Data	4.443
Mean	55.83	Mean of log Data	3.922
Median	54.71	SD of log Data	0.541
SD	21.31		
Coefficient of Variation	0.382		
Skewness	-0.231		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.874	Shapiro Wilk Test Statistic	0.736
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.88	95% H-UCL	83.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.98
95% Adjusted-CLT UCL (Chen-1995)	65.51	97.5% Chebyshev (MVUE) UCL	115.4
95% Modified-t UCL (Johnson-1978)	66.81	99% Chebyshev (MVUE) UCL	149.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.9	Data appear Normal at 5% Significance Level	
Theta Star	14.32		
MLE of Mean	55.83		
MLE of Standard Deviation	28.27		
nu star	93.61		
Approximate Chi Square Value (.05)	72.29	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	65.95
Adjusted Chi Square Value	69.44	95% Jackknife UCL	66.88
		95% Standard Bootstrap UCL	65.19
Anderson-Darling Test Statistic	0.922	95% Bootstrap-t UCL	67.11
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	66.61
Kolmogorov-Smirnov Test Statistic	0.239	95% Percentile Bootstrap UCL	65.46
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65.76
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.65
		97.5% Chebyshev(Mean, Sd) UCL	94.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117
95% Approximate Gamma UCL	72.29		
95% Adjusted Gamma UCL	75.27		

Potential UCL to Use		Use 95% Student's-t UCL	66.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	112.7	Minimum of Log Data	4.725
Maximum	1823	Maximum of Log Data	7.508
Mean	545.5	Mean of log Data	6.084
Median	486.8	SD of log Data	0.683
SD	434.5		
Coefficient of Variation	0.797		
Skewness	2.572		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.695	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	770.8	95% H-UCL	907.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1027
95% Adjusted-CLT UCL (Chen-1995)	851.4	97.5% Chebyshev (MVUE) UCL	1237
95% Modified-t UCL (Johnson-1978)	786.3	99% Chebyshev (MVUE) UCL	1649

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.897	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	287.6		
MLE of Mean	545.5		
MLE of Standard Deviation	396.1		
nu star	45.52		
Approximate Chi Square Value (.05)	31.05	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	751.8
Adjusted Chi Square Value	29.23	95% Jackknife UCL	770.8
		95% Standard Bootstrap UCL	737.6
Anderson-Darling Test Statistic	0.597	95% Bootstrap-t UCL	978.7
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1669
Kolmogorov-Smirnov Test Statistic	0.245	95% Percentile Bootstrap UCL	772.6
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	889
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1092
		97.5% Chebyshev(Mean, Sd) UCL	1329
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1794
95% Approximate Gamma UCL	799.9		
95% Adjusted Gamma UCL	849.6		

Potential UCL to Use		Use 95% Approximate Gamma UCL	799.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-09.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	5.75	Minimum of Log Data	1.749
Maximum	14	Maximum of Log Data	2.639
Mean	10.4	Mean of log Data	2.32
Median	11	SD of log Data	0.232
SD	2.062		
Coefficient of Variation	0.198		
Skewness	-1.112		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.778	Shapiro Wilk Test Statistic	0.72
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.42	95% H-UCL	11.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.37
95% Adjusted-CLT UCL (Chen-1995)	11.15	97.5% Chebyshev (MVUE) UCL	14.64
95% Modified-t UCL (Johnson-1978)	11.39	99% Chebyshev (MVUE) UCL	17.14

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.595		
MLE of Mean	10.4		
MLE of Standard Deviation	2.488		
nu star	454.6		
Approximate Chi Square Value (.05)	406.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	11.34
Adjusted Chi Square Value	399.7	95% Jackknife UCL	11.42
		95% Standard Bootstrap UCL	11.31
Anderson-Darling Test Statistic	1.8	95% Bootstrap-t UCL	11.26
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	11.21
Kolmogorov-Smirnov Test Statistic	0.374	95% Percentile Bootstrap UCL	11.27
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	11.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.9
		97.5% Chebyshev(Mean, Sd) UCL	13.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.09
95% Approximate Gamma UCL	11.64		
95% Adjusted Gamma UCL	11.83		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.42
	or 95% Modified-t UCL	11.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	35.65	Minimum of Log Data	3.574
Maximum	85	Maximum of Log Data	4.443
Mean	64.78	Mean of log Data	4.129
Median	64.78	SD of log Data	0.31
SD	18.78		
Coefficient of Variation	0.29		
Skewness	-0.135		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.07	95% H-UCL	77.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.48
95% Adjusted-CLT UCL (Chen-1995)	73.14	97.5% Chebyshev (MVUE) UCL	100.1
95% Modified-t UCL (Johnson-1978)	74.03	99% Chebyshev (MVUE) UCL	121

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.257	Data appear Lognormal at 5% Significance Level	
Theta Star	6.998		
MLE of Mean	64.78		
MLE of Standard Deviation	21.29		
nu star	240.7		
Approximate Chi Square Value (.05)	205.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	73.35
Adjusted Chi Square Value	201.2	95% Jackknife UCL	74.07
		95% Standard Bootstrap UCL	73.06
Anderson-Darling Test Statistic	0.764	95% Bootstrap-t UCL	73.29
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	73.03
Kolmogorov-Smirnov Test Statistic	0.244	95% Percentile Bootstrap UCL	72.84
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	72.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.49
		97.5% Chebyshev(Mean, Sd) UCL	97.31
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	116.6
95% Approximate Gamma UCL	75.77		
95% Adjusted Gamma UCL	77.51		

Potential UCL to Use		
	Use 95% Student's-t UCL	74.07
	or 95% Modified-t UCL	74.03
	or 95% H-UCL	77.35

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-10.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	14.08	Maximum of Log Data	2.645
Mean	10.96	Mean of log Data	2.365
Median	11	SD of log Data	0.28
SD	2.322		
Coefficient of Variation	0.212		
Skewness	-1.733		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.651	Shapiro Wilk Test Statistic	0.559
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.16	95% H-UCL	13
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.95
95% Adjusted-CLT UCL (Chen-1995)	11.7	97.5% Chebyshev (MVUE) UCL	16.65
95% Modified-t UCL (Johnson-1978)	12.11	99% Chebyshev (MVUE) UCL	19.98

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.88	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.851		
MLE of Mean	10.96		
MLE of Standard Deviation	3.053		
nu star	309.1		
Approximate Chi Square Value (.05)	269.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.06
Adjusted Chi Square Value	263.8	95% Jackknife UCL	12.16
		95% Standard Bootstrap UCL	12
Anderson-Darling Test Statistic	2.334	95% Bootstrap-t UCL	11.93
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.84
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	11.99
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.88
		97.5% Chebyshev(Mean, Sd) UCL	15.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.63
95% Approximate Gamma UCL	12.57		
95% Adjusted Gamma UCL	12.84		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.16
	or 95% Modified-t UCL	12.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cesium-137 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	15.6	Minimum of Log Data	2.747
Maximum	85	Maximum of Log Data	4.443
Mean	70.24	Mean of log Data	4.167
Median	77.62	SD of log Data	0.507
SD	22.25		
Coefficient of Variation	0.317		
Skewness	-1.812		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.702	Shapiro Wilk Test Statistic	0.606
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	81.77	95% H-UCL	101.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	119.9
95% Adjusted-CLT UCL (Chen-1995)	77.21	97.5% Chebyshev (MVUE) UCL	140.5
95% Modified-t UCL (Johnson-1978)	81.21	99% Chebyshev (MVUE) UCL	180.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.588	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.31		
MLE of Mean	70.24		
MLE of Standard Deviation	32.79		
nu star	110.1		
Approximate Chi Square Value (.05)	86.89	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	80.8
Adjusted Chi Square Value	83.74	95% Jackknife UCL	81.77
		95% Standard Bootstrap UCL	80.14
Anderson-Darling Test Statistic	1.911	95% Bootstrap-t UCL	79.05
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	78.35
Kolmogorov-Smirnov Test Statistic	0.387	95% Percentile Bootstrap UCL	80.08
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	77.25
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.23
		97.5% Chebyshev(Mean, Sd) UCL	110.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.1
95% Approximate Gamma UCL	89.01		
95% Adjusted Gamma UCL	92.35		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	98.23
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	9.4	Minimum of Log Data	2.241
Maximum	75.99	Maximum of Log Data	4.331
Mean	59.88	Mean of log Data	4.003
Median	65	SD of log Data	0.559
SD	16.56		
Coefficient of Variation	0.277		
Skewness	-2.958		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.581	Shapiro Wilk Test Statistic	0.439
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.46	95% H-UCL	93.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	108.9
95% Adjusted-CLT UCL (Chen-1995)	63.38	97.5% Chebyshev (MVUE) UCL	128.7
95% Modified-t UCL (Johnson-1978)	67.78	99% Chebyshev (MVUE) UCL	167.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.396	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.62		
MLE of Mean	59.88		
MLE of Standard Deviation	28.56		
nu star	105.5		
Approximate Chi Square Value (.05)	82.81	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	67.74
Adjusted Chi Square Value	79.74	95% Jackknife UCL	68.46
		95% Standard Bootstrap UCL	67.5
Anderson-Darling Test Statistic	2.865	95% Bootstrap-t UCL	65.68
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	64.75
Kolmogorov-Smirnov Test Statistic	0.472	95% Percentile Bootstrap UCL	65.98
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.71
		97.5% Chebyshev(Mean, Sd) UCL	89.73
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	107.4
95% Approximate Gamma UCL	76.3		
95% Adjusted Gamma UCL	79.23		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	80.71
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-11.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	11.6	Minimum of Log Data	2.451
Maximum	85	Maximum of Log Data	4.443
Mean	66.77	Mean of log Data	4.065
Median	85	SD of log Data	0.639
SD	26.98		
Coefficient of Variation	0.404		
Skewness	-1.231		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.719	Shapiro Wilk Test Statistic	0.674
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	80.75	95% H-UCL	111.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	128.5
95% Adjusted-CLT UCL (Chen-1995)	76.62	97.5% Chebyshev (MVUE) UCL	153.8
95% Modified-t UCL (Johnson-1978)	80.29	99% Chebyshev (MVUE) UCL	203.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.936	Data do not follow a Discernable Distribution (0.05)	
Theta Star	22.74		
MLE of Mean	66.77		
MLE of Standard Deviation	38.97		
nu star	70.46		
Approximate Chi Square Value (.05)	52.13	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	79.58
Adjusted Chi Square Value	49.74	95% Jackknife UCL	80.75
		95% Standard Bootstrap UCL	79.37
Anderson-Darling Test Statistic	1.74	95% Bootstrap-t UCL	78.35
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	76.46
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	77.6
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	76.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	100.7
		97.5% Chebyshev(Mean, Sd) UCL	115.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	144.3
95% Approximate Gamma UCL	90.23		
95% Adjusted Gamma UCL	94.59		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	100.7
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0408	Minimum of Log Data	-3.199
Maximum	10	Maximum of Log Data	2.303
Mean	8.813	Mean of log Data	1.805
Median	10	SD of log Data	1.578
SD	2.84		
Coefficient of Variation	0.322		
Skewness	-3.152		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.484	Shapiro Wilk Test Statistic	0.358
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.29	95% H-UCL	145.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	55.58
95% Adjusted-CLT UCL (Chen-1995)	9.365	97.5% Chebyshev (MVUE) UCL	72.05
95% Modified-t UCL (Johnson-1978)	10.16	99% Chebyshev (MVUE) UCL	104.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.175	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.498		
MLE of Mean	8.813		
MLE of Standard Deviation	8.129		
nu star	28.21		
Approximate Chi Square Value (.05)	17.09	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.16
Adjusted Chi Square Value	15.78	95% Jackknife UCL	10.29
		95% Standard Bootstrap UCL	10.06
Anderson-Darling Test Statistic	3.753	95% Bootstrap-t UCL	9.748
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	9.66
Kolmogorov-Smirnov Test Statistic	0.486	95% Percentile Bootstrap UCL	9.802
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	9.643
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.39
		97.5% Chebyshev(Mean, Sd) UCL	13.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.97
95% Approximate Gamma UCL	14.55		
95% Adjusted Gamma UCL	15.75		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) UCL	16.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	9	Minimum of Log Data	2.197
Maximum	100.7	Maximum of Log Data	4.612
Mean	72.37	Mean of log Data	4.166
Median	72.37	SD of log Data	0.641
SD	23.97		
Coefficient of Variation	0.331		
Skewness	-1.618		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.824	Shapiro Wilk Test Statistic	0.567
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	84.8	95% H-UCL	124.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	142.5
95% Adjusted-CLT UCL (Chen-1995)	80.3	97.5% Chebyshev (MVUE) UCL	170.6
95% Modified-t UCL (Johnson-1978)	84.26	99% Chebyshev (MVUE) UCL	225.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.27		
MLE of Mean	72.37		
MLE of Standard Deviation	39.23		
nu star	81.66		
Approximate Chi Square Value (.05)	61.84	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	83.75
Adjusted Chi Square Value	59.21	95% Jackknife UCL	84.8
		95% Standard Bootstrap UCL	83.4
Anderson-Darling Test Statistic	1.634	95% Bootstrap-t UCL	82.5
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	81.54
Kolmogorov-Smirnov Test Statistic	0.392	95% Percentile Bootstrap UCL	82.61
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	80.86
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	102.5
		97.5% Chebyshev(Mean, Sd) UCL	115.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	141.2
95% Approximate Gamma UCL	95.57		
95% Adjusted Gamma UCL	99.81		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	102.5
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.084	Minimum of Log Data	-2.477
Maximum	5	Maximum of Log Data	1.609
Mean	4.508	Mean of log Data	1.252
Median	5	SD of log Data	1.175
SD	1.406		
Coefficient of Variation	0.312		
Skewness	-3.356		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.406	Shapiro Wilk Test Statistic	0.347
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.237	95% H-UCL	21.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.64
95% Adjusted-CLT UCL (Chen-1995)	4.756	97.5% Chebyshev (MVUE) UCL	21.08
95% Modified-t UCL (Johnson-1978)	5.172	99% Chebyshev (MVUE) UCL	29.78

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.644	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.742		
MLE of Mean	4.508		
MLE of Standard Deviation	3.516		
nu star	39.46		
Approximate Chi Square Value (.05)	26.07	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.176
Adjusted Chi Square Value	24.41	95% Jackknife UCL	5.237
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.904	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.508	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.278
		97.5% Chebyshev(Mean, Sd) UCL	7.043
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.547
95% Approximate Gamma UCL	6.824		
95% Adjusted Gamma UCL	7.286		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.278
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.065	Minimum of Log Data	-2.733
Maximum	13.29	Maximum of Log Data	2.587
Mean	9.429	Mean of log Data	1.904
Median	10	SD of log Data	1.463
SD	3.121		
Coefficient of Variation	0.331		
Skewness	-2.723		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.579	Shapiro Wilk Test Statistic	0.376
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.05	95% H-UCL	105.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	50.7
95% Adjusted-CLT UCL (Chen-1995)	10.15	97.5% Chebyshev (MVUE) UCL	65.36
95% Modified-t UCL (Johnson-1978)	10.93	99% Chebyshev (MVUE) UCL	94.16

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.27	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.424		
MLE of Mean	9.429		
MLE of Standard Deviation	8.366		
nu star	30.48		
Approximate Chi Square Value (.05)	18.87	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.91
Adjusted Chi Square Value	17.49	95% Jackknife UCL	11.05
		95% Standard Bootstrap UCL	10.85
Anderson-Darling Test Statistic	3.568	95% Bootstrap-t UCL	10.51
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	10.44
Kolmogorov-Smirnov Test Statistic	0.521	95% Percentile Bootstrap UCL	10.61
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	10.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.36
		97.5% Chebyshev(Mean, Sd) UCL	15.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.39
95% Approximate Gamma UCL	15.23		
95% Adjusted Gamma UCL	16.43		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	13.36
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-12.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	13.2	Minimum of Log Data	2.58
Maximum	85	Maximum of Log Data	4.443
Mean	61.36	Mean of log Data	4.016
Median	61.36	SD of log Data	0.537
SD	22.83		
Coefficient of Variation	0.372		
Skewness	-0.801		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.754
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.19	95% H-UCL	91.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	107.1
95% Adjusted-CLT UCL (Chen-1995)	70.57	97.5% Chebyshev (MVUE) UCL	126.1
95% Modified-t UCL (Johnson-1978)	72.94	99% Chebyshev (MVUE) UCL	163.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.912	Data appear Normal at 5% Significance Level	
Theta Star	15.69		
MLE of Mean	61.36		
MLE of Standard Deviation	31.02		
nu star	93.89		
Approximate Chi Square Value (.05)	72.54	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	72.2
Adjusted Chi Square Value	69.68	95% Jackknife UCL	73.19
		95% Standard Bootstrap UCL	71.78
Anderson-Darling Test Statistic	0.951	95% Bootstrap-t UCL	71.7
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	70.88
Kolmogorov-Smirnov Test Statistic	0.309	95% Percentile Bootstrap UCL	71.4
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	71.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	90.08
		97.5% Chebyshev(Mean, Sd) UCL	102.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.9
95% Approximate Gamma UCL	79.41		
95% Adjusted Gamma UCL	82.67		

Potential UCL to Use		
	Use 95% Student's-t UCL	73.19

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	78.6	Maximum of Log Data	4.364
Mean	61.29	Mean of log Data	4.028
Median	65	SD of log Data	0.55
SD	17.15		
Coefficient of Variation	0.28		
Skewness	-2.719		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.611	Shapiro Wilk Test Statistic	0.456
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.18	95% H-UCL	94.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.2
95% Adjusted-CLT UCL (Chen-1995)	65.28	97.5% Chebyshev (MVUE) UCL	130.1
95% Modified-t UCL (Johnson-1978)	69.53	99% Chebyshev (MVUE) UCL	169
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.48	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.68		
MLE of Mean	61.29		
MLE of Standard Deviation	28.96		
nu star	107.5		
Approximate Chi Square Value (.05)	84.58	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.43
Adjusted Chi Square Value	81.48	95% Jackknife UCL	70.18
		95% Standard Bootstrap UCL	69.1
Anderson-Darling Test Statistic	2.72	95% Bootstrap-t UCL	67.44
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	66.5
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	67.77
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	66.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.87
		97.5% Chebyshev(Mean, Sd) UCL	92.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.6
95% Approximate Gamma UCL	77.9		
95% Adjusted Gamma UCL	80.87		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	82.87
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.36	Minimum of Log Data	-1.022
Maximum	11.98	Maximum of Log Data	2.483
Mean	9.043	Mean of log Data	2.007
Median	10	SD of log Data	0.957
SD	2.853		
Coefficient of Variation	0.315		
Skewness	-2.932		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.57	Shapiro Wilk Test Statistic	0.397
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.52	95% H-UCL	26.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	25.53
95% Adjusted-CLT UCL (Chen-1995)	9.652	97.5% Chebyshev (MVUE) UCL	31.74
95% Modified-t UCL (Johnson-1978)	10.41	99% Chebyshev (MVUE) UCL	43.94

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.096	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.313		
MLE of Mean	9.043		
MLE of Standard Deviation	6.245		
nu star	50.31		
Approximate Chi Square Value (.05)	35.02	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.4
Adjusted Chi Square Value	33.09	95% Jackknife UCL	10.52
		95% Standard Bootstrap UCL	10.33
Anderson-Darling Test Statistic	3.244	95% Bootstrap-t UCL	10.02
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	9.861
Kolmogorov-Smirnov Test Statistic	0.497	95% Percentile Bootstrap UCL	10.09
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	9.931
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.63
		97.5% Chebyshev(Mean, Sd) UCL	14.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.24
95% Approximate Gamma UCL	12.99		
95% Adjusted Gamma UCL	13.75		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.63
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-13.wst	
Full Precision	OFF	
Confidence Coefficient		95%
Number of Bootstrap Operations		2000

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	15	Minimum of Log Data	2.708
Maximum	85	Maximum of Log Data	4.443
Mean	62.92	Mean of log Data	4.064
Median	62.92	SD of log Data	0.464
SD	20.97		
Coefficient of Variation	0.333		
Skewness	-0.818		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.867	Shapiro Wilk Test Statistic	0.758
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.46	95% H-UCL	83.33
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.72
95% Adjusted-CLT UCL (Chen-1995)	70.61	97.5% Chebyshev (MVUE) UCL	113.6
95% Modified-t UCL (Johnson-1978)	72.27	99% Chebyshev (MVUE) UCL	142.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.286	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.9		
MLE of Mean	62.92		
MLE of Standard Deviation	27.37		
nu star	158.6		
Approximate Chi Square Value (.05)	130.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	71.83
Adjusted Chi Square Value	127.3	95% Jackknife UCL	72.46
		95% Standard Bootstrap UCL	71.36
Anderson-Darling Test Statistic	1.086	95% Bootstrap-t UCL	71.29
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	70.96
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	71.44
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	70.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.53
		97.5% Chebyshev(Mean, Sd) UCL	96.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	116.8
95% Approximate Gamma UCL	76.48		
95% Adjusted Gamma UCL	78.36		

Potential UCL to Use		
	Use 95% Student's-t UCL	72.46
	or 95% Modified-t UCL	72.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	9.8	Minimum of Log Data	2.282
Maximum	65	Maximum of Log Data	4.174
Mean	58.35	Mean of log Data	4
Median	60.31	SD of log Data	0.478
SD	13.81		
Coefficient of Variation	0.237		
Skewness	-3.514		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.467	Shapiro Wilk Test Statistic	0.369
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.63	95% H-UCL	79.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	94.26
95% Adjusted-CLT UCL (Chen-1995)	60.75	97.5% Chebyshev (MVUE) UCL	108.8
95% Modified-t UCL (Johnson-1978)	64.09	99% Chebyshev (MVUE) UCL	137.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.206	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.402		
MLE of Mean	58.35		
MLE of Standard Deviation	23.42		
nu star	186.2		
Approximate Chi Square Value (.05)	155.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	64.21
Adjusted Chi Square Value	152.2	95% Jackknife UCL	64.63
		95% Standard Bootstrap UCL	64.06
Anderson-Darling Test Statistic	3.89	95% Bootstrap-t UCL	62.64
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	61.99
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	62.78
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	62.03
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.89
		97.5% Chebyshev(Mean, Sd) UCL	80.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	93.83
95% Approximate Gamma UCL	69.8		
95% Adjusted Gamma UCL	71.38		

Potential UCL to Use		
	Use 95% Student's-t UCL	64.63
	or 95% Modified-t UCL	64.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-14.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	34.01	Minimum of Log Data	3.527
Maximum	85	Maximum of Log Data	4.443
Mean	62.01	Mean of log Data	4.063
Median	52.12	SD of log Data	0.378
SD	22.51		
Coefficient of Variation	0.363		
Skewness	0.0734		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.783
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.14	95% H-UCL	77.49
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.86
95% Adjusted-CLT UCL (Chen-1995)	72.41	97.5% Chebyshev (MVUE) UCL	103.3
95% Modified-t UCL (Johnson-1978)	73.16	99% Chebyshev (MVUE) UCL	127.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.149	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.08		
MLE of Mean	62.01		
MLE of Standard Deviation	25.01		
nu star	159.9		
Approximate Chi Square Value (.05)	131.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	72.28
Adjusted Chi Square Value	128	95% Jackknife UCL	73.14
		95% Standard Bootstrap UCL	72.05
Anderson-Darling Test Statistic	1.457	95% Bootstrap-t UCL	73.75
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	70.93
Kolmogorov-Smirnov Test Statistic	0.315	95% Percentile Bootstrap UCL	71.88
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	72.47
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	89.22
		97.5% Chebyshev(Mean, Sd) UCL	101
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124.1
95% Approximate Gamma UCL	75.31		
95% Adjusted Gamma UCL	77.46		

Potential UCL to Use		
	Use 95% Student's-t UCL	73.14
	or 95% Modified-t UCL	73.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0491	Minimum of Log Data	-3.014
Maximum	10	Maximum of Log Data	2.303
Mean	9.091	Mean of log Data	1.878
Median	10	SD of log Data	1.471
SD	2.765		
Coefficient of Variation	0.304		
Skewness	-3.41		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.386	Shapiro Wilk Test Statistic	0.328
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.46	95% H-UCL	93.84
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.67
95% Adjusted-CLT UCL (Chen-1995)	9.578	97.5% Chebyshev (MVUE) UCL	63.94
95% Modified-t UCL (Johnson-1978)	10.34	99% Chebyshev (MVUE) UCL	91.97

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.332	Data do not follow a Discernable Distribution (0.05)		
Theta Star	6.827			
MLE of Mean	9.091			
MLE of Standard Deviation	7.879			
nu star	34.62			
Approximate Chi Square Value (.05)	22.16	Nonparametric Statistics		
Adjusted Level of Significance	0.0301	95% CLT UCL		10.35
Adjusted Chi Square Value	20.75	95% Jackknife UCL		10.46
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.418	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.24	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12.43
		97.5% Chebyshev(Mean, Sd) UCL		13.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		16.72
95% Approximate Gamma UCL	14.2			
95% Adjusted Gamma UCL	15.17			

Potential UCL to Use		
Recommended UCL exceeds the maximum observation	Use 95% Chebyshev (Mean, Sd) UCL	12.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-15.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	39.11	Minimum of Log Data	3.666
Maximum	85	Maximum of Log Data	4.443
Mean	69.68	Mean of log Data	4.206
Median	77.34	SD of log Data	0.298
SD	18.29		
Coefficient of Variation	0.263		
Skewness	-0.684		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.778	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	77.7	95% H-UCL	80.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.85
95% Adjusted-CLT UCL (Chen-1995)	76.37	97.5% Chebyshev (MVUE) UCL	102.8
95% Modified-t UCL (Johnson-1978)	77.57	99% Chebyshev (MVUE) UCL	122.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.81	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.447		
MLE of Mean	69.68		
MLE of Standard Deviation	21.19		
nu star	345.9		
Approximate Chi Square Value (.05)	303.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	77.21
Adjusted Chi Square Value	299.3	95% Jackknife UCL	77.7
		95% Standard Bootstrap UCL	77.01
Anderson-Darling Test Statistic	1.595	95% Bootstrap-t UCL	76.84
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	75.87
Kolmogorov-Smirnov Test Statistic	0.299	95% Percentile Bootstrap UCL	76.69
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	75.95
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	89.62
		97.5% Chebyshev(Mean, Sd) UCL	98.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	115.2
95% Approximate Gamma UCL	79.34		
95% Adjusted Gamma UCL	80.53		

Potential UCL to Use		
	Use 95% Student's-t UCL	77.7
	or 95% Modified-t UCL	77.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	11.68	Maximum of Log Data	2.458
Mean	10.13	Mean of log Data	2.315
Median	10	SD of log Data	0.0385
SD	0.417		
Coefficient of Variation	0.0411		
Skewness	3.898		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.346	Shapiro Wilk Test Statistic	0.352
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.31	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.55
95% Adjusted-CLT UCL (Chen-1995)	10.41	97.5% Chebyshev (MVUE) UCL	10.74
95% Modified-t UCL (Johnson-1978)	10.33	99% Chebyshev (MVUE) UCL	11.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	559	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0181		
MLE of Mean	10.13		
MLE of Standard Deviation	0.428		
nu star	17889		
Approximate Chi Square Value (.05)	17579	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	10.3
Adjusted Chi Square Value	17544	95% Jackknife UCL	10.31
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.602	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.58
		97.5% Chebyshev(Mean, Sd) UCL	10.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.17
95% Approximate Gamma UCL	10.31		
95% Adjusted Gamma UCL	10.33		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.31
	or 95% Modified-t UCL	10.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-16.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Antimony

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	6.14	Minimum of Log Data	1.815
Maximum	17.8	Maximum of Log Data	2.879
Mean	10.35	Mean of log Data	2.307
Median	11	SD of log Data	0.257
SD	2.664		
Coefficient of Variation	0.257		
Skewness	0.98		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.767	Shapiro Wilk Test Statistic	0.8
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.52	95% H-UCL	11.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.28
95% Adjusted-CLT UCL (Chen-1995)	11.62	97.5% Chebyshev (MVUE) UCL	14.55
95% Modified-t UCL (Johnson-1978)	11.55	99% Chebyshev (MVUE) UCL	17.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.51	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.766		
MLE of Mean	10.35		
MLE of Standard Deviation	2.817		
nu star	432.2		
Approximate Chi Square Value (.05)	385	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	11.45
Adjusted Chi Square Value	380	95% Jackknife UCL	11.52
		95% Standard Bootstrap UCL	11.41
Anderson-Darling Test Statistic	1.716	95% Bootstrap-t UCL	11.63
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	12.16
Kolmogorov-Smirnov Test Statistic	0.317	95% Percentile Bootstrap UCL	11.43
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	11.57
Data not Gamma Distributed at 5% Significance Leve		95% Chebyshev(Mean, Sd) UCL	13.25
		97.5% Chebyshev(Mean, Sd) UCL	14.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.98
95% Approximate Gamma UCL	11.62		
95% Adjusted Gamma UCL	11.78		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.52
	or 95% Modified-t UCL	11.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	17.1	Minimum of Log Data	2.839
Maximum	85	Maximum of Log Data	4.443
Mean	59.25	Mean of log Data	3.985
Median	50.23	SD of log Data	0.482
SD	24.63		
Coefficient of Variation	0.416		
Skewness	-0.0583		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.813	Shapiro Wilk Test Statistic	0.839
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.05	95% H-UCL	77.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.25
95% Adjusted-CLT UCL (Chen-1995)	69.29	97.5% Chebyshev (MVUE) UCL	106.3
95% Modified-t UCL (Johnson-1978)	70.03	99% Chebyshev (MVUE) UCL	133.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.351	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.62		
MLE of Mean	59.25		
MLE of Standard Deviation	28.4		
nu star	139.2		
Approximate Chi Square Value (.05)	113	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	69.38
Adjusted Chi Square Value	110.3	95% Jackknife UCL	70.05
		95% Standard Bootstrap UCL	69.13
Anderson-Darling Test Statistic	1.146	95% Bootstrap-t UCL	69.91
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	69.02
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	68.82
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	69.13
Data not Gamma Distributed at 5% Significance Leve		95% Chebyshev(Mean, Sd) UCL	86.1
		97.5% Chebyshev(Mean, Sd) UCL	97.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	120.5
95% Approximate Gamma UCL	73.03		
95% Adjusted Gamma UCL	74.81		

Potential UCL to Use		
	Use 95% Student's-t UCL	70.05
	or 95% Modified-t UCL	70.03

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	8.6	Minimum of Log Data	2.152
Maximum	72.03	Maximum of Log Data	4.277
Mean	61.5	Mean of log Data	4.048
Median	65	SD of log Data	0.507
SD	14.35		
Coefficient of Variation	0.233		
Skewness	-3.771		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.392	Shapiro Wilk Test Statistic	0.324
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.79	95% H-UCL	85.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	101.4
95% Adjusted-CLT UCL (Chen-1995)	63.79	97.5% Chebyshev (MVUE) UCL	117.3
95% Modified-t UCL (Johnson-1978)	67.23	99% Chebyshev (MVUE) UCL	148.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.858	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.5		
MLE of Mean	61.5		
MLE of Standard Deviation	25.41		
nu star	187.5		
Approximate Chi Square Value (.05)	156.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	67.4
Adjusted Chi Square Value	153.6	95% Jackknife UCL	67.79
		95% Standard Bootstrap UCL	67.28
Anderson-Darling Test Statistic	4.922	95% Bootstrap-t UCL	65.93
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	65.18
Kolmogorov-Smirnov Test Statistic	0.483	95% Percentile Bootstrap UCL	65.6
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	65.44
Data not Gamma Distributed at 5% Significance Leve		95% Chebyshev(Mean, Sd) UCL	77.14
		97.5% Chebyshev(Mean, Sd) UCL	83.91
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	97.21
95% Approximate Gamma UCL	73.53		
95% Adjusted Gamma UCL	75.06		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) U	77.14

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Vanadium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-17.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	6.41	Minimum of Log Data	1.858
Maximum	13.96	Maximum of Log Data	2.636
Mean	10.67	Mean of log Data	2.354
Median	10.84	SD of log Data	0.179
SD	1.692		
Coefficient of Variation	0.159		
Skewness	-0.962		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.786	Shapiro Wilk Test Statistic	0.726
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.55	95% H-UCL	11.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.1
95% Adjusted-CLT UCL (Chen-1995)	11.33	97.5% Chebyshev (MVUE) UCL	14.14
95% Modified-t UCL (Johnson-1978)	11.52	99% Chebyshev (MVUE) UCL	16.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	28.08	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.38		
MLE of Mean	10.67		
MLE of Standard Deviation	2.014		
nu star	673.9		
Approximate Chi Square Value (.05)	614.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.47
Adjusted Chi Square Value	606	95% Jackknife UCL	11.55
		95% Standard Bootstrap UCL	11.44
Anderson-Darling Test Statistic	1.484	95% Bootstrap-t UCL	11.39
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.43
Kolmogorov-Smirnov Test Statistic	0.355	95% Percentile Bootstrap UCL	11.39
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.8
		97.5% Chebyshev(Mean, Sd) UCL	13.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.53
95% Approximate Gamma UCL	11.7		
95% Adjusted Gamma UCL	11.86		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.55
	or 95% Modified-t UCL	11.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cadmium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	16.4	Minimum of Log Data	2.797
Maximum	85	Maximum of Log Data	4.443
Mean	53.58	Mean of log Data	3.889
Median	53.58	SD of log Data	0.477
SD	22.07		
Coefficient of Variation	0.412		
Skewness	0.214		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.02	95% H-UCL	74.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	87.46
95% Adjusted-CLT UCL (Chen-1995)	64.48	97.5% Chebyshev (MVUE) UCL	101.8
95% Modified-t UCL (Johnson-1978)	65.09	99% Chebyshev (MVUE) UCL	130.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.243	Data appear Normal at 5% Significance Level	
Theta Star	12.63		
MLE of Mean	53.58		
MLE of Standard Deviation	26.01		
nu star	101.8		
Approximate Chi Square Value (.05)	79.55	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.06
Adjusted Chi Square Value	76.55	95% Jackknife UCL	65.02
		95% Standard Bootstrap UCL	63.65
Anderson-Darling Test Statistic	0.499	95% Bootstrap-t UCL	66.78
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	64.73
Kolmogorov-Smirnov Test Statistic	0.194	95% Percentile Bootstrap UCL	63.92
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	63.41
Data appear Gamma Distributed at 5% Significance Lev		95% Chebyshev(Mean, Sd) UCL	81.35
		97.5% Chebyshev(Mean, Sd) UCL	93.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117
95% Approximate Gamma UCL	68.59		
95% Adjusted Gamma UCL	71.28		

Potential UCL to Use	Use 95% Student's-t UCL	65.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-18.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	6.05	Minimum of Log Data	1.8
Maximum	13.5	Maximum of Log Data	2.603
Mean	9.234	Mean of log Data	2.188
Median	8.86	SD of log Data	0.275
SD	2.571		
Coefficient of Variation	0.278		
Skewness	0.511		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.57	95% H-UCL	10.84
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.45
95% Adjusted-CLT UCL (Chen-1995)	10.57	97.5% Chebyshev (MVUE) UCL	13.84
95% Modified-t UCL (Johnson-1978)	10.59	99% Chebyshev (MVUE) UCL	16.58

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.93	Data appear Normal at 5% Significance Level	
Theta Star	0.845		
MLE of Mean	9.234		
MLE of Standard Deviation	2.793		
nu star	262.3		
Approximate Chi Square Value (.05)	225.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.45
Adjusted Chi Square Value	220.6	95% Jackknife UCL	10.57
		95% Standard Bootstrap UCL	10.39
Anderson-Darling Test Statistic	0.365	95% Bootstrap-t UCL	10.81
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.49
Kolmogorov-Smirnov Test Statistic	0.185	95% Percentile Bootstrap UCL	10.45
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.48
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.47
		97.5% Chebyshev(Mean, Sd) UCL	13.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.62
95% Approximate Gamma UCL	10.73		
95% Adjusted Gamma UCL	10.98		

Potential UCL to Use		Use 95% Student's-t UCL	10.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	17.2	Minimum of Log Data	2.845
Maximum	85	Maximum of Log Data	4.443
Mean	68.78	Mean of log Data	4.145
Median	85	SD of log Data	0.494
SD	23.37		
Coefficient of Variation	0.34		
Skewness	-1.278		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.687
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	80.89	95% H-UCL	98.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	115.4
95% Adjusted-CLT UCL (Chen-1995)	77.22	97.5% Chebyshev (MVUE) UCL	134.8
95% Modified-t UCL (Johnson-1978)	80.48	99% Chebyshev (MVUE) UCL	172.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.546	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.13		
MLE of Mean	68.78		
MLE of Standard Deviation	32.26		
nu star	109.1		
Approximate Chi Square Value (.05)	85.99	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	79.87
Adjusted Chi Square Value	82.87	95% Jackknife UCL	80.89
		95% Standard Bootstrap UCL	79.69
Anderson-Darling Test Statistic	1.505	95% Bootstrap-t UCL	78.7
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	77.6
Kolmogorov-Smirnov Test Statistic	0.332	95% Percentile Bootstrap UCL	78.56
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	77.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.18
		97.5% Chebyshev(Mean, Sd) UCL	110.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	135.9
95% Approximate Gamma UCL	87.26		
95% Adjusted Gamma UCL	90.55		

Potential UCL to Use		
	Use 95% Student's-t UCL	80.89
	or 95% Modified-t UCL	80.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	14	Minimum of Log Data	2.639
Maximum	65	Maximum of Log Data	4.174
Mean	60.15	Mean of log Data	4.037
Median	65	SD of log Data	0.441
SD	14.68		
Coefficient of Variation	0.244		
Skewness	-3.35		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Test Statistic	0.361
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.76	95% H-UCL	82.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.92
95% Adjusted-CLT UCL (Chen-1995)	62.74	97.5% Chebyshev (MVUE) UCL	112.1
95% Modified-t UCL (Johnson-1978)	67.08	99% Chebyshev (MVUE) UCL	141.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.409	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.385		
MLE of Mean	60.15		
MLE of Standard Deviation	23.76		
nu star	153.8		
Approximate Chi Square Value (.05)	126.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	67.12
Adjusted Chi Square Value	122.3	95% Jackknife UCL	67.76
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.715	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.62
		97.5% Chebyshev(Mean, Sd) UCL	86.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	102.3
95% Approximate Gamma UCL	73.34		
95% Adjusted Gamma UCL	75.63		

Potential UCL to Use		
	Use 95% Student's-t UCL	67.76
	or 95% Modified-t UCL	67.08

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-19.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	6	Minimum of Log Data	1.792
Maximum	12	Maximum of Log Data	2.485
Mean	9.775	Mean of log Data	2.262
Median	9.775	SD of log Data	0.207
SD	1.771		
Coefficient of Variation	0.181		
Skewness	-1.245		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.836	Shapiro Wilk Test Statistic	0.782
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.69	95% H-UCL	11.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.35
95% Adjusted-CLT UCL (Chen-1995)	10.42	97.5% Chebyshev (MVUE) UCL	13.46
95% Modified-t UCL (Johnson-1978)	10.66	99% Chebyshev (MVUE) UCL	15.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	21.09	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.464		
MLE of Mean	9.775		
MLE of Standard Deviation	2.129		
nu star	506.1		
Approximate Chi Square Value (.05)	454.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.62
Adjusted Chi Square Value	447.5	95% Jackknife UCL	10.69
		95% Standard Bootstrap UCL	10.57
Anderson-Darling Test Statistic	1.127	95% Bootstrap-t UCL	10.52
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.45
Kolmogorov-Smirnov Test Statistic	0.29	95% Percentile Bootstrap UCL	10.53
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12
		97.5% Chebyshev(Mean, Sd) UCL	12.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.86
95% Approximate Gamma UCL	10.87		
95% Adjusted Gamma UCL	11.05		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.69
	or 95% Modified-t UCL	10.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	13.6	Minimum of Log Data	2.61
Maximum	85	Maximum of Log Data	4.443
Mean	53.77	Mean of log Data	3.887
Median	53.77	SD of log Data	0.504
SD	22.04		
Coefficient of Variation	0.41		
Skewness	0.143		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.19	95% H-UCL	76.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.28
95% Adjusted-CLT UCL (Chen-1995)	64.51	97.5% Chebyshev (MVUE) UCL	105.7
95% Modified-t UCL (Johnson-1978)	65.24	99% Chebyshev (MVUE) UCL	135.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.022	Data appear Normal at 5% Significance Level	
Theta Star	13.37		
MLE of Mean	53.77		
MLE of Standard Deviation	26.81		
nu star	96.54		
Approximate Chi Square Value (.05)	74.87	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.23
Adjusted Chi Square Value	71.97	95% Jackknife UCL	65.19
		95% Standard Bootstrap UCL	64.01
Anderson-Darling Test Statistic	0.606	95% Bootstrap-t UCL	65.58
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	65.52
Kolmogorov-Smirnov Test Statistic	0.192	95% Percentile Bootstrap UCL	64.17
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	64.07
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.5
		97.5% Chebyshev(Mean, Sd) UCL	93.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117.1
95% Approximate Gamma UCL	69.32		
95% Adjusted Gamma UCL	72.12		

Potential UCL to Use		Use 95% Student's-t UCL	65.19

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	55.62	Minimum of Log Data	4.019
Maximum	65	Maximum of Log Data	4.174
Mean	63	Mean of log Data	4.142
Median	64	SD of log Data	0.0497
SD	3.012		
Coefficient of Variation	0.0478		
Skewness	-1.806		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.702	Shapiro Wilk Test Statistic	0.692
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.56	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.94
95% Adjusted-CLT UCL (Chen-1995)	63.95	97.5% Chebyshev (MVUE) UCL	68.65
95% Modified-t UCL (Johnson-1978)	64.49	99% Chebyshev (MVUE) UCL	72

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	340.1	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.185		
MLE of Mean	63		
MLE of Standard Deviation	3.416		
nu star	8163		
Approximate Chi Square Value (.05)	7954	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.43
Adjusted Chi Square Value	7922	95% Jackknife UCL	64.56
		95% Standard Bootstrap UCL	64.33
Anderson-Darling Test Statistic	1.601	95% Bootstrap-t UCL	64.2
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	64.04
Kolmogorov-Smirnov Test Statistic	0.34	95% Percentile Bootstrap UCL	64.33
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	64
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.79
		97.5% Chebyshev(Mean, Sd) UCL	68.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	71.65
95% Approximate Gamma UCL	64.66		
95% Adjusted Gamma UCL	64.91		

Potential UCL to Use		
	Use 95% Student's-t UCL	64.56
	or 95% Modified-t UCL	64.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-20.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	5.67	Minimum of Log Data	1.735
Maximum	16.4	Maximum of Log Data	2.797
Mean	10.32	Mean of log Data	2.295
Median	11	SD of log Data	0.3
SD	2.926		
Coefficient of Variation	0.284		
Skewness	0.249		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.9	Shapiro Wilk Test Statistic	0.891
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.84	95% H-UCL	12.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.27
95% Adjusted-CLT UCL (Chen-1995)	11.77	97.5% Chebyshev (MVUE) UCL	15.98
95% Modified-t UCL (Johnson-1978)	11.85	99% Chebyshev (MVUE) UCL	19.32

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.712	Data appear Normal at 5% Significance Level	
Theta Star	1.063		
MLE of Mean	10.32		
MLE of Standard Deviation	3.311		
nu star	233.1		
Approximate Chi Square Value (.05)	198.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.71
Adjusted Chi Square Value	193.9	95% Jackknife UCL	11.84
		95% Standard Bootstrap UCL	11.64
Anderson-Darling Test Statistic	0.777	95% Bootstrap-t UCL	11.84
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	12.07
Kolmogorov-Smirnov Test Statistic	0.294	95% Percentile Bootstrap UCL	11.69
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14
		97.5% Chebyshev(Mean, Sd) UCL	15.59
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.72
95% Approximate Gamma UCL	12.1		
95% Adjusted Gamma UCL	12.4		

Potential UCL to Use		Use 95% Student's-t UCL	11.84

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Barium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	32.59	Minimum of Log Data	3.484
Maximum	85	Maximum of Log Data	4.443
Mean	59.11	Mean of log Data	4.004
Median	49.97	SD of log Data	0.41
SD	23.52		
Coefficient of Variation	0.398		
Skewness	0.207		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.809
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.31	95% H-UCL	76.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.18
95% Adjusted-CLT UCL (Chen-1995)	70.71	97.5% Chebyshev (MVUE) UCL	103.6
95% Modified-t UCL (Johnson-1978)	71.37	99% Chebyshev (MVUE) UCL	130

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.123	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.54		
MLE of Mean	59.11		
MLE of Standard Deviation	26.12		
nu star	122.9		
Approximate Chi Square Value (.05)	98.34	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	70.28
Adjusted Chi Square Value	94.98	95% Jackknife UCL	71.31
		95% Standard Bootstrap UCL	69.74
Anderson-Darling Test Statistic	1.105	95% Bootstrap-t UCL	73.58
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	69.02
Kolmogorov-Smirnov Test Statistic	0.287	95% Percentile Bootstrap UCL	70
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	70.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.71
		97.5% Chebyshev(Mean, Sd) UCL	101.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.7
95% Approximate Gamma UCL	73.91		
95% Adjusted Gamma UCL	76.52		

Potential UCL to Use		
	Use 95% Student's-t UCL	71.31
	or 95% Modified-t UCL	71.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	189	Minimum of Log Data	5.242
Maximum	4670	Maximum of Log Data	8.449
Mean	725.9	Mean of log Data	6.082
Median	371.4	SD of log Data	0.8
SD	1246		
Coefficient of Variation	1.716		
Skewness	3.425		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.402	Shapiro Wilk Test Statistic	0.686
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1372	95% H-UCL	1121
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1201
95% Adjusted-CLT UCL (Chen-1995)	1698	97.5% Chebyshev (MVUE) UCL	1468
95% Modified-t UCL (Johnson-1978)	1431	99% Chebyshev (MVUE) UCL	1993

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	806.5		
MLE of Mean	725.9		
MLE of Standard Deviation	765.1		
nu star	21.6		
Approximate Chi Square Value (.05)	12.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1318
Adjusted Chi Square Value	10.97	95% Jackknife UCL	1372
		95% Standard Bootstrap UCL	1291
Anderson-Darling Test Statistic	2.337	95% Bootstrap-t UCL	6382
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	4664
Kolmogorov-Smirnov Test Statistic	0.419	95% Percentile Bootstrap UCL	1426
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	1768
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2294
		97.5% Chebyshev(Mean, Sd) UCL	2972
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4305
95% Approximate Gamma UCL	1302		
95% Adjusted Gamma UCL	1430		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2294

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.513
Maximum	10	Maximum of Log Data	2.303
Mean	8.942	Mean of log Data	1.791
Median	10	SD of log Data	1.673
SD	2.914		
Coefficient of Variation	0.326		
Skewness	-3.09		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.434	Shapiro Wilk Test Statistic	0.351
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.45	95% H-UCL	208.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64.46
95% Adjusted-CLT UCL (Chen-1995)	9.524	97.5% Chebyshev (MVUE) UCL	83.92
95% Modified-t UCL (Johnson-1978)	10.33	99% Chebyshev (MVUE) UCL	122.1

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.102	Data do not follow a Discernable Distribution (0.05)		
Theta Star	8.115			
MLE of Mean	8.942			
MLE of Standard Deviation	8.519			
nu star	26.45			
Approximate Chi Square Value (.05)	15.72	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		10.33
Adjusted Chi Square Value	14.48	95% Jackknife UCL		10.45
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.947	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.495	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12.61
		97.5% Chebyshev(Mean, Sd) UCL		14.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		17.31
95% Approximate Gamma UCL	15.04			
95% Adjusted Gamma UCL	16.34			

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.31
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	15.8	Minimum of Log Data	2.76
Maximum	65.7	Maximum of Log Data	4.185
Mean	60.96	Mean of log Data	4.057
Median	65	SD of log Data	0.409
SD	14.22		
Coefficient of Variation	0.233		
Skewness	-3.46		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.335	Shapiro Wilk Test Statistic	0.332
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.33	95% H-UCL	80.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	95
95% Adjusted-CLT UCL (Chen-1995)	63.33	97.5% Chebyshev (MVUE) UCL	109.1
95% Modified-t UCL (Johnson-1978)	67.65	99% Chebyshev (MVUE) UCL	136.8

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	7.284	Data do not follow a Discernable Distribution (0.05)		
Theta Star	8.369			
MLE of Mean	60.96			
MLE of Standard Deviation	22.59			
nu star	174.8			
Approximate Chi Square Value (.05)	145.2	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		67.71
Adjusted Chi Square Value	141.1	95% Jackknife UCL		68.33
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.066	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.538	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		78.85
		97.5% Chebyshev(Mean, Sd) UCL		86.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		101.8
95% Approximate Gamma UCL	73.37			
95% Adjusted Gamma UCL	75.51			

Potential UCL to Use		
	Use 95% Student's-t UCL	68.33
	or 95% Modified-t UCL	67.65

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	12.22	Maximum of Log Data	2.503
Mean	9.354	Mean of log Data	1.843
Median	10	SD of log Data	1.656
SD	3.004		
Coefficient of Variation	0.321		
Skewness	-3.15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.348
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.91	95% H-UCL	204.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.89
95% Adjusted-CLT UCL (Chen-1995)	9.937	97.5% Chebyshev (MVUE) UCL	85.72
95% Modified-t UCL (Johnson-1978)	10.78	99% Chebyshev (MVUE) UCL	124.7

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.118	Data do not follow a Discernable Distribution (0.05)		
Theta Star	8.366			
MLE of Mean	9.354			
MLE of Standard Deviation	8.846			
nu star	26.84			
Approximate Chi Square Value (.05)	16.02	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		10.78
Adjusted Chi Square Value	14.76	95% Jackknife UCL		10.91
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.056	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.558	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		13.13
		97.5% Chebyshev(Mean, Sd) UCL		14.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		17.98
95% Approximate Gamma UCL	15.67			
95% Adjusted Gamma UCL	17.01			

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.98
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Vanadium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	194-22.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	34.27	Minimum of Log Data	3.534
Maximum	85	Maximum of Log Data	4.443
Mean	52.15	Mean of log Data	3.914
Median	50.56	SD of log Data	0.284
SD	16.54		
Coefficient of Variation	0.317		
Skewness	1.419		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.79	Shapiro Wilk Test Statistic	0.874
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.72	95% H-UCL	61.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	70.74
95% Adjusted-CLT UCL (Chen-1995)	62.09	97.5% Chebyshev (MVUE) UCL	78.85
95% Modified-t UCL (Johnson-1978)	61.05	99% Chebyshev (MVUE) UCL	94.78

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.64	Data appear Lognormal at 5% Significance Level	
Theta Star	5.409		
MLE of Mean	52.15		
MLE of Standard Deviation	16.8		
nu star	231.4		
Approximate Chi Square Value (.05)	197.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	60
Adjusted Chi Square Value	192.3	95% Jackknife UCL	60.72
		95% Standard Bootstrap UCL	59.79
Anderson-Darling Test Statistic	0.817	95% Bootstrap-t UCL	69.44
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	116.3
Kolmogorov-Smirnov Test Statistic	0.296	95% Percentile Bootstrap UCL	60.42
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	61.71
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.96
		97.5% Chebyshev(Mean, Sd) UCL	81.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	99.65
95% Approximate Gamma UCL	61.2		
95% Adjusted Gamma UCL	62.73		

Potential UCL to Use	
Use 95% Student's-t UCL	60.72
or 95% Modified-t UCL	61.05
or 95% H-UCL	61.47

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	77.88	Minimum of Log Data	4.355
Maximum	1700	Maximum of Log Data	7.438
Mean	564.7	Mean of log Data	6.131
Median	564.7	SD of log Data	0.716
SD	397.6		
Coefficient of Variation	0.704		
Skewness	2.279		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.739	Shapiro Wilk Test Statistic	0.863
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	770.8	95% H-UCL	1006
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1124
95% Adjusted-CLT UCL (Chen-1995)	834.2	97.5% Chebyshev (MVUE) UCL	1360
95% Modified-t UCL (Johnson-1978)	783.4	99% Chebyshev (MVUE) UCL	1823

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.998	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	282.6		
MLE of Mean	564.7		
MLE of Standard Deviation	399.5		
nu star	47.96		
Approximate Chi Square Value (.05)	33.07	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	753.5
Adjusted Chi Square Value	31.19	95% Jackknife UCL	770.8
		95% Standard Bootstrap UCL	739.3
Anderson-Darling Test Statistic	0.732	95% Bootstrap-t UCL	928.5
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1685
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	746.6
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	842.2
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1065
		97.5% Chebyshev(Mean, Sd) UCL	1282
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1707
95% Approximate Gamma UCL	819.1		
95% Adjusted Gamma UCL	868.4		

Potential UCL to Use		Use 95% Approximate Gamma UCL	819.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.35	Minimum of Log Data	-1.05
Maximum	18	Maximum of Log Data	2.89
Mean	5.415	Mean of log Data	1.301
Median	5	SD of log Data	1.134
SD	4.373		
Coefficient of Variation	0.808		
Skewness	2.264		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.665
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.682	95% H-UCL	20.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.42
95% Adjusted-CLT UCL (Chen-1995)	8.373	97.5% Chebyshev (MVUE) UCL	20.73
95% Modified-t UCL (Johnson-1978)	7.82	99% Chebyshev (MVUE) UCL	29.19
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.13	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.792		
MLE of Mean	5.415		
MLE of Standard Deviation	5.094		
nu star	27.12		
Approximate Chi Square Value (.05)	16.25	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	7.492
Adjusted Chi Square Value	14.97	95% Jackknife UCL	7.682
		95% Standard Bootstrap UCL	7.417
Anderson-Darling Test Statistic	1.938	95% Bootstrap-t UCL	9.175
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	17.59
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	7.547
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	8.354
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.92
		97.5% Chebyshev(Mean, Sd) UCL	13.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.98
95% Approximate Gamma UCL	9.04		
95% Adjusted Gamma UCL	9.809		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	10.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-23.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.82	Minimum of Log Data	1.761
Maximum	18.03	Maximum of Log Data	2.892
Mean	9.833	Mean of log Data	2.246
Median	9.306	SD of log Data	0.289
SD	3.118		
Coefficient of Variation	0.317		
Skewness	1.621		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.45	95% H-UCL	11.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.42
95% Adjusted-CLT UCL (Chen-1995)	11.76	97.5% Chebyshev (MVUE) UCL	14.97
95% Modified-t UCL (Johnson-1978)	11.52	99% Chebyshev (MVUE) UCL	18.04

Gamma Distribution Test		Data Distribution
k star (bias corrected)	9.507	Data appear Gamma Distributed at 5% Significance Level
Theta Star	1.034	
MLE of Mean	9.833	
MLE of Standard Deviation	3.189	
nu star	228.2	
Approximate Chi Square Value (.05)	194.2	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 11.31
Adjusted Chi Square Value	189.4	95% Jackknife UCL 11.45
		95% Standard Bootstrap UCL 11.27
Anderson-Darling Test Statistic	0.456	95% Bootstrap-t UCL 12.16
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL 18.85
Kolmogorov-Smirnov Test Statistic	0.226	95% Percentile Bootstrap UCL 11.38
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL 11.47
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 13.76
		97.5% Chebyshev(Mean, Sd) UCL 15.45
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 18.79
95% Approximate Gamma UCL	11.55	
95% Adjusted Gamma UCL	11.84	

Potential UCL to Use		Use 95% Approximate Gamma UCL	11.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	36.93	Minimum of Log Data	3.609
Maximum	85	Maximum of Log Data	4.443
Mean	61.03	Mean of log Data	4.062
Median	59.21	SD of log Data	0.331
SD	19.75		
Coefficient of Variation	0.324		
Skewness	0.208		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.27	95% H-UCL	74.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.79
95% Adjusted-CLT UCL (Chen-1995)	70.77	97.5% Chebyshev (MVUE) UCL	97.92
95% Modified-t UCL (Johnson-1978)	71.32	99% Chebyshev (MVUE) UCL	119.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.75	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.875		
MLE of Mean	61.03		
MLE of Standard Deviation	21.92		
nu star	186		
Approximate Chi Square Value (.05)	155.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	70.41
Adjusted Chi Square Value	151.2	95% Jackknife UCL	71.27
		95% Standard Bootstrap UCL	70.02
Anderson-Darling Test Statistic	0.667	95% Bootstrap-t UCL	71.72
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	69.18
Kolmogorov-Smirnov Test Statistic	0.223	95% Percentile Bootstrap UCL	69.82
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	70.27
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.88
		97.5% Chebyshev(Mean, Sd) UCL	96.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117.8
95% Approximate Gamma UCL	73.02		
95% Adjusted Gamma UCL	75.08		

Potential UCL to Use			
		Use 95% Approximate Gamma UCL	73.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	8291	Minimum of Log Data	9.023
Maximum	33875	Maximum of Log Data	10.43
Mean	14986	Mean of log Data	9.554
Median	13464	SD of log Data	0.339
SD	6428		
Coefficient of Variation	0.429		
Skewness	2.586		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.702	Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18319	95% H-UCL	18261
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21279
95% Adjusted-CLT UCL (Chen-1995)	19519	97.5% Chebyshev (MVUE) UCL	24054
95% Modified-t UCL (Johnson-1978)	18550	99% Chebyshev (MVUE) UCL	29504

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.38	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	2349		
MLE of Mean	14986		
MLE of Standard Deviation	5933		
nu star	153.1		
Approximate Chi Square Value (.05)	125.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	18039
Adjusted Chi Square Value	121.7	95% Jackknife UCL	18319
		95% Standard Bootstrap UCL	17903
Anderson-Darling Test Statistic	0.817	95% Bootstrap-t UCL	21569
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	31684
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	18235
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	19555
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23075
		97.5% Chebyshev(Mean, Sd) UCL	26575
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	33450
95% Approximate Gamma UCL	18282		
95% Adjusted Gamma UCL	18855		

Potential UCL to Use		Use 95% Approximate Gamma UCL	18282

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	9.6	Minimum of Log Data	2.262
Maximum	88.92	Maximum of Log Data	4.488
Mean	62.99	Mean of log Data	4.045
Median	65	SD of log Data	0.579
SD	19.63		
Coefficient of Variation	0.312		
Skewness	-1.73		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.728	Shapiro Wilk Test Statistic	0.528
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.16	95% H-UCL	99.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.3
95% Adjusted-CLT UCL (Chen-1995)	69.28	97.5% Chebyshev (MVUE) UCL	137.9
95% Modified-t UCL (Johnson-1978)	72.69	99% Chebyshev (MVUE) UCL	180.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.002	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.74		
MLE of Mean	62.99		
MLE of Standard Deviation	31.48		
nu star	96.05		
Approximate Chi Square Value (.05)	74.45	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	72.31
Adjusted Chi Square Value	71.55	95% Jackknife UCL	73.16
		95% Standard Bootstrap UCL	71.94
Anderson-Darling Test Statistic	2.194	95% Bootstrap-t UCL	70.63
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	70.47
Kolmogorov-Smirnov Test Statistic	0.383	95% Percentile Bootstrap UCL	70.72
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	69.72
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.69
		97.5% Chebyshev(Mean, Sd) UCL	98.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	119.4
95% Approximate Gamma UCL	81.26		
95% Adjusted Gamma UCL	84.56		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCl	87.69

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.029	Minimum of Log Data	-3.54
Maximum	11.48	Maximum of Log Data	2.441
Mean	9.228	Mean of log Data	1.82
Median	10	SD of log Data	1.689
SD	2.94		
Coefficient of Variation	0.319		
Skewness	-3.28		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.347
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.75	95% H-UCL	228.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	68.19
95% Adjusted-CLT UCL (Chen-1995)	9.766	97.5% Chebyshev (MVUE) UCL	88.83
95% Modified-t UCL (Johnson-1978)	10.62	99% Chebyshev (MVUE) UCL	129.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.096	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.418		
MLE of Mean	9.228		
MLE of Standard Deviation	8.814		
nu star	26.31		
Approximate Chi Square Value (.05)	15.62	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.62
Adjusted Chi Square Value	14.37	95% Jackknife UCL	10.75
		95% Standard Bootstrap UCL	10.54
Anderson-Darling Test Statistic	4.038	95% Bootstrap-t UCL	10.3
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	10.05
Kolmogorov-Smirnov Test Statistic	0.529	95% Percentile Bootstrap UCL	10.24
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	10.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.93
		97.5% Chebyshev(Mean, Sd) UCL	14.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.67
95% Approximate Gamma UCL	15.55		
95% Adjusted Gamma UCL	16.89		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCl	17.67
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-24.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	37.95	Minimum of Log Data	3.636
Maximum	85	Maximum of Log Data	4.443
Mean	56.09	Mean of log Data	3.965
Median	42.85	SD of log Data	0.36
SD	21.57		
Coefficient of Variation	0.385		
Skewness	0.745		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.696	Shapiro Wilk Test Statistic	0.726
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.27	95% H-UCL	69.74
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.56
95% Adjusted-CLT UCL (Chen-1995)	67.76	97.5% Chebyshev (MVUE) UCL	92.66
95% Modified-t UCL (Johnson-1978)	67.5	99% Chebyshev (MVUE) UCL	114.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.184	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.07		
MLE of Mean	56.09		
MLE of Standard Deviation	22.56		
nu star	148.4		
Approximate Chi Square Value (.05)	121.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	66.33
Adjusted Chi Square Value	117.5	95% Jackknife UCL	67.27
		95% Standard Bootstrap UCL	66.05
Anderson-Darling Test Statistic	1.662	95% Bootstrap-t UCL	67.09
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	63.47
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	66.69
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	67.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.24
		97.5% Chebyshev(Mean, Sd) UCL	94.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	118.1
95% Approximate Gamma UCL	68.65		
95% Adjusted Gamma UCL	70.84		

Potential UCL to Use		
	Use 95% Student's-t UCL	67.27
	or 95% Modified-t UCL	67.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	13.4	Minimum of Log Data	2.595
Maximum	84.13	Maximum of Log Data	4.432
Mean	62.29	Mean of log Data	4.064
Median	65	SD of log Data	0.469
SD	16.35		
Coefficient of Variation	0.262		
Skewness	-2.653		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.51	Shapiro Wilk Test Statistic	0.419
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.77	95% H-UCL	87.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	103.1
95% Adjusted-CLT UCL (Chen-1995)	66.2	97.5% Chebyshev (MVUE) UCL	119.8
95% Modified-t UCL (Johnson-1978)	70.17	99% Chebyshev (MVUE) UCL	152.7

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	5.727	Data do not follow a Discernable Distribution (0.05)		
Theta Star	10.88			
MLE of Mean	62.29			
MLE of Standard Deviation	26.03			
nu star	137.4			
Approximate Chi Square Value (.05)	111.4	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		70.06
Adjusted Chi Square Value	107.8	95% Jackknife UCL		70.77
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.335	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.511	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		82.87
		97.5% Chebyshev(Mean, Sd) UCL		91.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		109.3
95% Approximate Gamma UCL	76.89			
95% Adjusted Gamma UCL	79.44			

Potential UCL to Use		
	Use 95% Student's-t UCL	70.77
	or 95% Modified-t UCL	70.17

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-25.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Barium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Barium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	39.22	Minimum of Log Data	3.669
Maximum	85	Maximum of Log Data	4.443
Mean	56.55	Mean of log Data	4.016
Median	56.55	SD of log Data	0.206
SD	12.13		
Coefficient of Variation	0.214		
Skewness	1.195		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.58	95% H-UCL	64.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.61
95% Adjusted-CLT UCL (Chen-1995)	64.41	97.5% Chebyshev (MVUE) UCL	79.57
95% Modified-t UCL (Johnson-1978)	63.82	99% Chebyshev (MVUE) UCL	93.24

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.21	Data appear Lognormal at 5% Significance Level	
Theta Star	3.106		
MLE of Mean	56.55		
MLE of Standard Deviation	13.25		
nu star	364.2		
Approximate Chi Square Value (.05)	321	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	62.86
Adjusted Chi Square Value	313.9	95% Jackknife UCL	63.58
		95% Standard Bootstrap UCL	62.59
Anderson-Darling Test Statistic	0.918	95% Bootstrap-t UCL	65
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	95.43
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	62.5
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	64.19
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.27
		97.5% Chebyshev(Mean, Sd) UCL	80.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	94.71
95% Approximate Gamma UCL	64.17		
95% Adjusted Gamma UCL	65.61		

Potential UCL to Use		
	Use 95% Student's-t UCL	63.58
	or 95% Modified-t UCL	63.82
	or 95% H-UCL	64.47

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Manganese

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	161.9	Minimum of Log Data	5.087
Maximum	1800	Maximum of Log Data	7.496
Mean	543.8	Mean of log Data	6.055
Median	543.8	SD of log Data	0.706
SD	470.7		
Coefficient of Variation	0.866		
Skewness	2.45		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.665	Shapiro Wilk Test Statistic	0.881
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	816.6	95% H-UCL	995.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1065
95% Adjusted-CLT UCL (Chen-1995)	911.8	97.5% Chebyshev (MVUE) UCL	1296
95% Modified-t UCL (Johnson-1978)	835.8	99% Chebyshev (MVUE) UCL	1749

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.611	Data appear Lognormal at 5% Significance Level	
Theta Star	337.6		
MLE of Mean	543.8		
MLE of Standard Deviation	428.5		
nu star	32.22		
Approximate Chi Square Value (.05)	20.24	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	788.6
Adjusted Chi Square Value	18.61	95% Jackknife UCL	816.6
		95% Standard Bootstrap UCL	768.5
Anderson-Darling Test Statistic	0.777	95% Bootstrap-t UCL	1066
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	1796
Kolmogorov-Smirnov Test Statistic	0.31	95% Percentile Bootstrap UCL	809
Kolmogorov-Smirnov 5% Critical Value	0.27	95% BCA Bootstrap UCL	883.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1193
		97.5% Chebyshev(Mean, Sd) UCL	1473
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2025
95% Approximate Gamma UCL	865.4		
95% Adjusted Gamma UCL	941.3		

Potential UCL to Use	Use 95% H-UCL	995.7

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	65	Maximum of Log Data	4.174
Mean	53.66	Mean of log Data	3.889
Median	53.66	SD of log Data	0.565
SD	16.28		
Coefficient of Variation	0.303		
Skewness	-2.51		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.5
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.1	95% H-UCL	88.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	101.1
95% Adjusted-CLT UCL (Chen-1995)	57.77	97.5% Chebyshev (MVUE) UCL	120.5
95% Modified-t UCL (Johnson-1978)	62.42	99% Chebyshev (MVUE) UCL	158.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.904	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.75		
MLE of Mean	53.66		
MLE of Standard Deviation	27.16		
nu star	78.08		
Approximate Chi Square Value (.05)	58.72	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	62.13
Adjusted Chi Square Value	55.81	95% Jackknife UCL	63.1
		95% Standard Bootstrap UCL	61.88
Anderson-Darling Test Statistic	2.082	95% Bootstrap-t UCL	60.26
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	59.14
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	60.3
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	59.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.1
		97.5% Chebyshev(Mean, Sd) UCL	85.81
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.9
95% Approximate Gamma UCL	71.35		
95% Adjusted Gamma UCL	75.07		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	76.1
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-26.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	14.6	Minimum of Log Data	2.681
Maximum	85	Maximum of Log Data	4.443
Mean	68.82	Mean of log Data	4.132
Median	85	SD of log Data	0.542
SD	24.36		
Coefficient of Variation	0.354		
Skewness	-1.376		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.724	Shapiro Wilk Test Statistic	0.661
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	81.45	95% H-UCL	103.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	121.1
95% Adjusted-CLT UCL (Chen-1995)	77.4	97.5% Chebyshev (MVUE) UCL	142.7
95% Modified-t UCL (Johnson-1978)	80.98	99% Chebyshev (MVUE) UCL	185.1

Gamma Distribution Test		Data Distribution
k star (bias corrected)	3.936	Data do not follow a Discernable Distribution (0.05)
Theta Star	17.49	
MLE of Mean	68.82	
MLE of Standard Deviation	34.69	
nu star	94.46	
Approximate Chi Square Value (.05)	73.05	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 80.39
Adjusted Chi Square Value	70.18	95% Jackknife UCL 81.45
		95% Standard Bootstrap UCL 79.76
Anderson-Darling Test Statistic	1.69	95% Bootstrap-t UCL 79.19
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL 77.36
Kolmogorov-Smirnov Test Statistic	0.323	95% Percentile Bootstrap UCL 79.61
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL 77.79
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 99.47
		97.5% Chebyshev(Mean, Sd) UCL 112.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 138.8
95% Approximate Gamma UCL	89	
95% Adjusted Gamma UCL	92.64	

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	99.47
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.046	Minimum of Log Data	-3.079
Maximum	10.27	Maximum of Log Data	2.329
Mean	9.032	Mean of log Data	1.839
Median	10	SD of log Data	1.549
SD	2.857		
Coefficient of Variation	0.316		
Skewness	-3.352		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.421	Shapiro Wilk Test Statistic	0.345
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.51	95% H-UCL	135.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54.84
95% Adjusted-CLT UCL (Chen-1995)	9.536	97.5% Chebyshev (MVUE) UCL	71
95% Modified-t UCL (Johnson-1978)	10.38	99% Chebyshev (MVUE) UCL	102.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.202	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.512		
MLE of Mean	9.032		
MLE of Standard Deviation	8.237		
nu star	28.85		
Approximate Chi Square Value (.05)	17.59	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.39
Adjusted Chi Square Value	16.26	95% Jackknife UCL	10.51
		95% Standard Bootstrap UCL	10.32
Anderson-Darling Test Statistic	4.004	95% Bootstrap-t UCL	10.06
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	9.839
Kolmogorov-Smirnov Test Statistic	0.524	95% Percentile Bootstrap UCL	9.964
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	9.861
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.63
		97.5% Chebyshev(Mean, Sd) UCL	14.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.24
95% Approximate Gamma UCL	14.81		
95% Adjusted Gamma UCL	16.02		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.24
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-27.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	39.28	Minimum of Log Data	3.671
Maximum	85	Maximum of Log Data	4.443
Mean	55.66	Mean of log Data	3.992
Median	52.04	SD of log Data	0.237
SD	14.67		
Coefficient of Variation	0.264		
Skewness	1.46		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.784	Shapiro Wilk Test Statistic	0.859
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.26	95% H-UCL	63.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.25
95% Adjusted-CLT UCL (Chen-1995)	64.53	97.5% Chebyshev (MVUE) UCL	79.47
95% Modified-t UCL (Johnson-1978)	63.56	99% Chebyshev (MVUE) UCL	93.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.76	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.046		
MLE of Mean	55.66		
MLE of Standard Deviation	15.01		
nu star	330.1		
Approximate Chi Square Value (.05)	289	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	62.62
Adjusted Chi Square Value	283.2	95% Jackknife UCL	63.26
		95% Standard Bootstrap UCL	62.44
Anderson-Darling Test Statistic	0.913	95% Bootstrap-t UCL	71.36
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	114.5
Kolmogorov-Smirnov Test Statistic	0.302	95% Percentile Bootstrap UCL	63.11
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	64.49
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.11
		97.5% Chebyshev(Mean, Sd) UCL	82.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	97.79
95% Approximate Gamma UCL	63.57		
95% Adjusted Gamma UCL	64.89		

Potential UCL to Use		
	Use 95% Student's-t UCL	63.26
	or 95% Modified-t UCL	63.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	11.6	Minimum of Log Data	2.451
Maximum	65.5	Maximum of Log Data	4.182
Mean	59.12	Mean of log Data	4.008
Median	65	SD of log Data	0.492
SD	15.2		
Coefficient of Variation	0.257		
Skewness	-3.283		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.449	Shapiro Wilk Test Statistic	0.388
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67	95% H-UCL	85.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	100.3
95% Adjusted-CLT UCL (Chen-1995)	61.9	97.5% Chebyshev (MVUE) UCL	117.2
95% Modified-t UCL (Johnson-1978)	66.31	99% Chebyshev (MVUE) UCL	150.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.394	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.96		
MLE of Mean	59.12		
MLE of Standard Deviation	25.46		
nu star	129.4		
Approximate Chi Square Value (.05)	104.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	66.34
Adjusted Chi Square Value	100.7	95% Jackknife UCL	67
		95% Standard Bootstrap UCL	66.06
Anderson-Darling Test Statistic	3.348	95% Bootstrap-t UCL	64.55
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	63.49
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	64.15
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	64.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.25
		97.5% Chebyshev(Mean, Sd) UCL	86.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	102.8
95% Approximate Gamma UCL	73.47		
95% Adjusted Gamma UCL	75.99		

Potential UCL to Use		Use 95% Student's-t UCL	67
		or 95% Modified-t UCL	66.31

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.044	Minimum of Log Data	-3.124
Maximum	10.12	Maximum of Log Data	2.315
Mean	8.907	Mean of log Data	1.822
Median	10	SD of log Data	1.558
SD	2.835		
Coefficient of Variation	0.318		
Skewness	-3.282		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.45	Shapiro Wilk Test Statistic	0.351
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.38	95% H-UCL	137.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54.74
95% Adjusted-CLT UCL (Chen-1995)	9.425	97.5% Chebyshev (MVUE) UCL	70.9
95% Modified-t UCL (Johnson-1978)	10.25	99% Chebyshev (MVUE) UCL	102.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.194	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.463		
MLE of Mean	8.907		
MLE of Standard Deviation	8.153		
nu star	28.65		
Approximate Chi Square Value (.05)	17.43	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.25
Adjusted Chi Square Value	16.11	95% Jackknife UCL	10.38
		95% Standard Bootstrap UCL	10.15
Anderson-Darling Test Statistic	3.883	95% Bootstrap-t UCL	9.913
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	9.717
Kolmogorov-Smirnov Test Statistic	0.524	95% Percentile Bootstrap UCL	9.838
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	9.737
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.47
		97.5% Chebyshev(Mean, Sd) UCL	14.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.05
95% Approximate Gamma UCL	14.64		
95% Adjusted Gamma UCL	15.84		

Potential UCL to Use		
Recommended UCL exceeds the maximum observation	Use 99% Chebyshev (Mean, Sd) UCL	17.05

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	194-28.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	7.11	Minimum of Log Data	1.962
Maximum	14.8	Maximum of Log Data	2.695
Mean	10.92	Mean of log Data	2.372
Median	11	SD of log Data	0.208
SD	2.128		
Coefficient of Variation	0.195		
Skewness	-0.197		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.8	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.03	95% H-UCL	12.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.8
95% Adjusted-CLT UCL (Chen-1995)	11.9	97.5% Chebyshev (MVUE) UCL	15.05
95% Modified-t UCL (Johnson-1978)	12.02	99% Chebyshev (MVUE) UCL	17.48

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.1	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.543		
MLE of Mean	10.92		
MLE of Standard Deviation	2.436		
nu star	482.5		
Approximate Chi Square Value (.05)	432.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.93
Adjusted Chi Square Value	425.3	95% Jackknife UCL	12.03
		95% Standard Bootstrap UCL	11.86
Anderson-Darling Test Statistic	1.508	95% Bootstrap-t UCL	12
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	12.24
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	11.86
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.86
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.6
		97.5% Chebyshev(Mean, Sd) UCL	14.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.04
95% Approximate Gamma UCL	12.19		
95% Adjusted Gamma UCL	12.39		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.03
	or 95% Modified-t UCL	12.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	17.2	Minimum of Log Data	2.845
Maximum	85	Maximum of Log Data	4.443
Mean	50.02	Mean of log Data	3.831
Median	46.09	SD of log Data	0.437
SD	20.59		
Coefficient of Variation	0.412		
Skewness	0.663		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.7	95% H-UCL	66.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	78.44
95% Adjusted-CLT UCL (Chen-1995)	61.02	97.5% Chebyshev (MVUE) UCL	90.62
95% Modified-t UCL (Johnson-1978)	60.89	99% Chebyshev (MVUE) UCL	114.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.759	Data appear Normal at 5% Significance Level	
Theta Star	10.51		
MLE of Mean	50.02		
MLE of Standard Deviation	22.93		
nu star	114.2		
Approximate Chi Square Value (.05)	90.54	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	59.8
Adjusted Chi Square Value	87.32	95% Jackknife UCL	60.7
		95% Standard Bootstrap UCL	59.34
Anderson-Darling Test Statistic	0.534	95% Bootstrap-t UCL	62.97
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	62.82
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	59.52
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	61.06
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.93
		97.5% Chebyshev(Mean, Sd) UCL	87.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.2
95% Approximate Gamma UCL	63.1		
95% Adjusted Gamma UCL	65.42		

Potential UCL to Use		Use 95% Student's-t UCL	60.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	149.4	Minimum of Log Data	5.006
Maximum	2400	Maximum of Log Data	7.783
Mean	678.5	Mean of log Data	6.124
Median	343.1	SD of log Data	0.897
SD	686.2		
Coefficient of Variation	1.011		
Skewness	1.707		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.76	Shapiro Wilk Test Statistic	0.912
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1034	95% H-UCL	1431
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1437
95% Adjusted-CLT UCL (Chen-1995)	1109	97.5% Chebyshev (MVUE) UCL	1776
95% Modified-t UCL (Johnson-1978)	1051	99% Chebyshev (MVUE) UCL	2442

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.111	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	610.6		
MLE of Mean	678.5		
MLE of Standard Deviation	643.7		
nu star	26.67		
Approximate Chi Square Value (.05)	15.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1004
Adjusted Chi Square Value	14.64	95% Jackknife UCL	1034
		95% Standard Bootstrap UCL	986.7
Anderson-Darling Test Statistic	0.736	95% Bootstrap-t UCL	1304
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	1136
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	1013
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	1088
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1542
		97.5% Chebyshev(Mean, Sd) UCL	1915
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2649
95% Approximate Gamma UCL	1138		
95% Adjusted Gamma UCL	1236		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1138

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	13.6	Minimum of Log Data	2.61
Maximum	69.74	Maximum of Log Data	4.245
Mean	61.57	Mean of log Data	4.057
Median	65	SD of log Data	0.456
SD	15.2		
Coefficient of Variation	0.247		
Skewness	-3.381		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.414	Shapiro Wilk Test Statistic	0.37
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.45	95% H-UCL	85.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	100.7
95% Adjusted-CLT UCL (Chen-1995)	64.21	97.5% Chebyshev (MVUE) UCL	116.8
95% Modified-t UCL (Johnson-1978)	68.73	99% Chebyshev (MVUE) UCL	148.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.091	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.11		
MLE of Mean	61.57		
MLE of Standard Deviation	24.94		
nu star	146.2		
Approximate Chi Square Value (.05)	119.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	68.78
Adjusted Chi Square Value	115.5	95% Jackknife UCL	69.45
		95% Standard Bootstrap UCL	68.56
Anderson-Darling Test Statistic	3.629	95% Bootstrap-t UCL	67.03
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	65.77
Kolmogorov-Smirnov Test Statistic	0.524	95% Percentile Bootstrap UCL	66.51
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	66.17
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.7
		97.5% Chebyshev(Mean, Sd) UCL	88.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105.2
95% Approximate Gamma UCL	75.48		
95% Adjusted Gamma UCL	77.9		

Potential UCL to Use		
	Use 95% Student's-t UCL	69.45
	or 95% Modified-t UCL	68.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	11.83	Maximum of Log Data	2.471
Mean	10.43	Mean of log Data	2.342
Median	10	SD of log Data	0.0645
SD	0.697		
Coefficient of Variation	0.0668		
Skewness	1.405		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.665	Shapiro Wilk Test Statistic	0.668
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.79	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.27
95% Adjusted-CLT UCL (Chen-1995)	10.84	97.5% Chebyshev (MVUE) UCL	11.64
95% Modified-t UCL (Johnson-1978)	10.8	99% Chebyshev (MVUE) UCL	12.36

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	192.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0542		
MLE of Mean	10.43		
MLE of Standard Deviation	0.752		
nu star	4616		
Approximate Chi Square Value (.05)	4459	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.76
Adjusted Chi Square Value	4436	95% Jackknife UCL	10.79
		95% Standard Bootstrap UCL	10.74
Anderson-Darling Test Statistic	1.957	95% Bootstrap-t UCL	11.04
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.85
Kolmogorov-Smirnov Test Statistic	0.407	95% Percentile Bootstrap UCL	10.78
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.84
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.3
		97.5% Chebyshev(Mean, Sd) UCL	11.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.43
95% Approximate Gamma UCL	10.79		
95% Adjusted Gamma UCL	10.85		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.79
	or 95% Modified-t UCL	10.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Vanadium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	194-30.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	37.64	Minimum of Log Data	3.628
Maximum	85	Maximum of Log Data	4.443
Mean	57.92	Mean of log Data	4.022
Median	56.57	SD of log Data	0.279
SD	16.9		
Coefficient of Variation	0.292		
Skewness	0.799		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.27	95% H-UCL	67.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.56
95% Adjusted-CLT UCL (Chen-1995)	66.74	97.5% Chebyshev (MVUE) UCL	86.09
95% Modified-t UCL (Johnson-1978)	66.45	99% Chebyshev (MVUE) UCL	102.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.58	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5.472		
MLE of Mean	57.92		
MLE of Standard Deviation	17.8		
nu star	275.2		
Approximate Chi Square Value (.05)	237.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	65.63
Adjusted Chi Square Value	232.8	95% Jackknife UCL	66.27
		95% Standard Bootstrap UCL	65.26
Anderson-Darling Test Statistic	0.661	95% Bootstrap-t UCL	68.07
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	65.4
Kolmogorov-Smirnov Test Statistic	0.233	95% Percentile Bootstrap UCL	65.66
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	66.52
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.35
		97.5% Chebyshev(Mean, Sd) UCL	87.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.6
95% Approximate Gamma UCL	67.04		
95% Adjusted Gamma UCL	68.46		

Potential UCL to Use		Use 95% Approximate Gamma UCL	67.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	10	Maximum of Log Data	2.303
Mean	9.88	Mean of log Data	2.29
Median	10	SD of log Data	0.035
SD	0.329		
Coefficient of Variation	0.0333		
Skewness	-3.452		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.414	Shapiro Wilk Test Statistic	0.408
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.04	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.3
95% Adjusted-CLT UCL (Chen-1995)	9.937	97.5% Chebyshev (MVUE) UCL	10.48
95% Modified-t UCL (Johnson-1978)	10.03	99% Chebyshev (MVUE) UCL	10.83

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	703.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.014		
MLE of Mean	9.88		
MLE of Standard Deviation	0.372		
nu star	18295		
Approximate Chi Square Value (.05)	17982	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.03
Adjusted Chi Square Value	17937	95% Jackknife UCL	10.04
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.422	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.28
		97.5% Chebyshev(Mean, Sd) UCL	10.45
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.79
95% Approximate Gamma UCL	10.05		
95% Adjusted Gamma UCL	10.08		

Potential UCL to Use		Use 95% Student's-t UCL	10.04
		or 95% Modified-t UCL	10.03

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	7.2	Minimum of Log Data	1.974
Maximum	69.87	Maximum of Log Data	4.247
Mean	59.47	Mean of log Data	3.987
Median	65	SD of log Data	0.607
SD	16.03		
Coefficient of Variation	0.269		
Skewness	-3.355		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.49	Shapiro Wilk Test Statistic	0.384
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.39	95% H-UCL	96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	112.2
95% Adjusted-CLT UCL (Chen-1995)	62.36	97.5% Chebyshev (MVUE) UCL	133.2
95% Modified-t UCL (Johnson-1978)	66.7	99% Chebyshev (MVUE) UCL	174.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.087	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.55		
MLE of Mean	59.47		
MLE of Standard Deviation	29.41		
nu star	106.3		
Approximate Chi Square Value (.05)	83.47	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	66.78
Adjusted Chi Square Value	80.59	95% Jackknife UCL	67.39
		95% Standard Bootstrap UCL	66.47
Anderson-Darling Test Statistic	3.519	95% Bootstrap-t UCL	64.95
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	63.82
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	64.9
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	64.28
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.84
		97.5% Chebyshev(Mean, Sd) UCL	87.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	103.7
95% Approximate Gamma UCL	75.7		
95% Adjusted Gamma UCL	78.4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	78.84

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	10	Maximum of Log Data	2.303
Mean	8.948	Mean of log Data	1.826
Median	10	SD of log Data	1.603
SD	2.716		
Coefficient of Variation	0.303		
Skewness	-3.444		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.431	Shapiro Wilk Test Statistic	0.332
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.29	95% H-UCL	140.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.99
95% Adjusted-CLT UCL (Chen-1995)	9.418	97.5% Chebyshev (MVUE) UCL	76.44
95% Modified-t UCL (Johnson-1978)	10.17	99% Chebyshev (MVUE) UCL	110.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.215	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.366		
MLE of Mean	8.948		
MLE of Standard Deviation	8.119		
nu star	31.58		
Approximate Chi Square Value (.05)	19.74	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.19
Adjusted Chi Square Value	18.42	95% Jackknife UCL	10.29
		95% Standard Bootstrap UCL	10.16
Anderson-Darling Test Statistic	4.3	95% Bootstrap-t UCL	9.9
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	9.699
Kolmogorov-Smirnov Test Statistic	0.531	95% Percentile Bootstrap UCL	9.814
Kolmogorov-Smirnov 5% Critical Value	0.241	95% BCA Bootstrap UCL	9.733
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.23
		97.5% Chebyshev(Mean, Sd) UCL	13.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.44
95% Approximate Gamma UCL	14.32		
95% Adjusted Gamma UCL	15.34		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	16.44
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	200-01.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Antimony

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.3	Minimum of Log Data	-1.204
Maximum	0.56	Maximum of Log Data	-0.58
Mean	0.37	Mean of log Data	-0.999
Median	0.37	SD of log Data	0.0951
SD	0.0401		
Coefficient of Variation	0.108		
Skewness	3.572		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.382	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.398
95% Adjusted-CLT UCL (Chen-1995)	0.387	97.5% Chebyshev (MVUE) UCL	0.41
95% Modified-t UCL (Johnson-1978)	0.383	99% Chebyshev (MVUE) UCL	0.434

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	95.11	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00389		
MLE of Mean	0.37		
MLE of Standard Deviation	0.0379		
nu star	5707		
Approximate Chi Square Value (.05)	5532	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	0.382
Adjusted Chi Square Value	5522	95% Jackknife UCL	0.382
		95% Standard Bootstrap UCL	0.382
Anderson-Darling Test Statistic	7.052	95% Bootstrap-t UCL	0.389
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.441
Kolmogorov-Smirnov Test Statistic	0.454	95% Percentile Bootstrap UCL	0.383
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	0.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.402
		97.5% Chebyshev(Mean, Sd) UCL	0.416
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.443
95% Approximate Gamma UCL	0.382		
95% Adjusted Gamma UCL	0.382		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.382
	or 95% Modified-t UCL	0.383

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	30	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	11	Maximum of Log Data	2.398
Mean	9.094	Mean of log Data	2.179
Median	9.605	SD of log Data	0.254
SD	2.054		
Coefficient of Variation	0.226		
Skewness	-0.666		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.731	95% H-UCL	9.924
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.98
95% Adjusted-CLT UCL (Chen-1995)	9.662	97.5% Chebyshev (MVUE) UCL	11.78
95% Modified-t UCL (Johnson-1978)	9.723	99% Chebyshev (MVUE) UCL	13.37
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.85	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.574		
MLE of Mean	9.094		
MLE of Standard Deviation	2.284		
nu star	950.9		
Approximate Chi Square Value (.05)	880.3	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	9.711
Adjusted Chi Square Value	876.4	95% Jackknife UCL	9.731
		95% Standard Bootstrap UCL	9.712
Anderson-Darling Test Statistic	1.897	95% Bootstrap-t UCL	9.683
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	9.655
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	9.656
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	9.672
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.73
		97.5% Chebyshev(Mean, Sd) UCL	11.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.82
95% Approximate Gamma UCL	9.823		
95% Adjusted Gamma UCL	9.867		
Potential UCL to Use		Use 95% Student's-t UCL	9.731
		or 95% Modified-t UCL	9.723

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.023	Minimum of Log Data	-3.772
Maximum	0.9	Maximum of Log Data	-0.105
Mean	0.371	Mean of log Data	-1.077
Median	0.371	SD of log Data	0.549
SD	0.122		
Coefficient of Variation	0.33		
Skewness	2.019		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.353
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.409	95% H-UCL	0.485
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.575
95% Adjusted-CLT UCL (Chen-1995)	0.417	97.5% Chebyshev (MVUE) UCL	0.653
95% Modified-t UCL (Johnson-1978)	0.41	99% Chebyshev (MVUE) UCL	0.807

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.434	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0683		
MLE of Mean	0.371		
MLE of Standard Deviation	0.159		
nu star	326		
Approximate Chi Square Value (.05)	285.2	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	0.408
Adjusted Chi Square Value	283	95% Jackknife UCL	0.409
		95% Standard Bootstrap UCL	0.408
Anderson-Darling Test Statistic	8.597	95% Bootstrap-t UCL	0.416
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.481
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	0.406
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	0.424
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.468
		97.5% Chebyshev(Mean, Sd) UCL	0.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.593
95% Approximate Gamma UCL	0.424		
95% Adjusted Gamma UCL	0.427		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	0.468

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	23

Raw Statistics		Log-transformed Statistics	
Minimum	11.6	Minimum of Log Data	2.451
Maximum	85	Maximum of Log Data	4.443
Mean	52.88	Mean of log Data	3.836
Median	53.38	SD of log Data	0.577
SD	23.86		
Coefficient of Variation	0.451		
Skewness	-0.0121		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.28	95% H-UCL	67.92
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	80.77
95% Adjusted-CLT UCL (Chen-1995)	60.04	97.5% Chebyshev (MVUE) UCL	92.19
95% Modified-t UCL (Johnson-1978)	60.28	99% Chebyshev (MVUE) UCL	114.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.563	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	14.84		
MLE of Mean	52.88		
MLE of Standard Deviation	28.01		
nu star	213.8		
Approximate Chi Square Value (.05)	180.9	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	60.05
Adjusted Chi Square Value	179.2	95% Jackknife UCL	60.28
		95% Standard Bootstrap UCL	59.95
Anderson-Darling Test Statistic	0.928	95% Bootstrap-t UCL	60.29
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	60
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	60.16
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	59.86
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	71.87
		97.5% Chebyshev(Mean, Sd) UCL	80.09
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	96.23
95% Approximate Gamma UCL	62.48		
95% Adjusted Gamma UCL	63.08		

Potential UCL to Use		Use 95% Approximate Gamma UCL	62.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	30

Raw Statistics		Log-transformed Statistics	
Minimum	124.6	Minimum of Log Data	4.825
Maximum	1210	Maximum of Log Data	7.098
Mean	391.3	Mean of log Data	5.846
Median	366.9	SD of log Data	0.504
SD	213.1		
Coefficient of Variation	0.545		
Skewness	1.991		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.983
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	457.3	95% H-UCL	471.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	554.5
95% Adjusted-CLT UCL (Chen-1995)	470.3	97.5% Chebyshev (MVUE) UCL	625.4
95% Modified-t UCL (Johnson-1978)	459.7	99% Chebyshev (MVUE) UCL	764.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.823	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	102.3		
MLE of Mean	391.3		
MLE of Standard Deviation	200.1		
nu star	229.4		
Approximate Chi Square Value (.05)	195.3	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	455.2
Adjusted Chi Square Value	193.5	95% Jackknife UCL	457.3
		95% Standard Bootstrap UCL	453.7
Anderson-Darling Test Statistic	0.222	95% Bootstrap-t UCL	480.8
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	527.1
Kolmogorov-Smirnov Test Statistic	0.0777	95% Percentile Bootstrap UCL	460.2
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	469
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	560.8
		97.5% Chebyshev(Mean, Sd) UCL	634.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	778.3
95% Approximate Gamma UCL	459.5		
95% Adjusted Gamma UCL	463.8		

Potential UCL to Use		Use 95% Approximate Gamma UCL	459.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.0154	Minimum of Log Data	-4.173
Maximum	10	Maximum of Log Data	2.303
Mean	7.793	Mean of log Data	1.052
Median	10	SD of log Data	2.487
SD	4.031		
Coefficient of Variation	0.517		
Skewness	-1.455		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.553	Shapiro Wilk Test Statistic	0.518
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.043	95% H-UCL	558.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	167.4
95% Adjusted-CLT UCL (Chen-1995)	8.794	97.5% Chebyshev (MVUE) UCL	220.3
95% Modified-t UCL (Johnson-1978)	9.011	99% Chebyshev (MVUE) UCL	324.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.576	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.54		
MLE of Mean	7.793		
MLE of Standard Deviation	10.27		
nu star	34.54		
Approximate Chi Square Value (.05)	22.1	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	9.003
Adjusted Chi Square Value	21.52	95% Jackknife UCL	9.043
		95% Standard Bootstrap UCL	8.967
Anderson-Darling Test Statistic	8.137	95% Bootstrap-t UCL	8.89
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	8.766
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	8.893
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	8.791
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11
		97.5% Chebyshev(Mean, Sd) UCL	12.39
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.12
95% Approximate Gamma UCL	12.18		
95% Adjusted Gamma UCL	12.51		

Potential UCL to Use	Use 97.5% Chebyshev (Mean, Sd) UCL	12.39
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	23

Raw Statistics		Log-transformed Statistics	
Minimum	6.2	Minimum of Log Data	1.825
Maximum	259.5	Maximum of Log Data	5.559
Mean	78.45	Mean of log Data	4
Median	65	SD of log Data	1.008
SD	59.41		
Coefficient of Variation	0.757		
Skewness	1.372		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.833	Shapiro Wilk Test Statistic	0.822
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	96.88	95% H-UCL	144.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	170.4
95% Adjusted-CLT UCL (Chen-1995)	99.19	97.5% Chebyshev (MVUE) UCL	205.8
95% Modified-t UCL (Johnson-1978)	97.33	99% Chebyshev (MVUE) UCL	275.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.394	Data do not follow a Discernable Distribution (0.05)	
Theta Star	56.28		
MLE of Mean	78.45		
MLE of Standard Deviation	66.45		
nu star	83.63		
Approximate Chi Square Value (.05)	63.56	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	96.29
Adjusted Chi Square Value	62.55	95% Jackknife UCL	96.88
		95% Standard Bootstrap UCL	96.46
Anderson-Darling Test Statistic	1.83	95% Bootstrap-t UCL	101.7
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	102.3
Kolmogorov-Smirnov Test Statistic	2.78E-01	95% Percentile Bootstrap UCL	97.09
Kolmogorov-Smirnov 5% Critical Value	0.163	95% BCA Bootstrap UCL	98.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	125.7
		97.5% Chebyshev(Mean, Sd) UCL	146.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	186.4
95% Approximate Gamma UCL	103.2		
95% Adjusted Gamma UCL	104.9		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	125.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.3	Minimum of Log Data	-1.204
Maximum	5	Maximum of Log Data	1.609
Mean	4.161	Mean of log Data	1.308
Median	4.161	SD of log Data	0.672
SD	1.168		
Coefficient of Variation	0.281		
Skewness	-2.549		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.601	Shapiro Wilk Test Statistic	0.416
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.524	95% H-UCL	6.029
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.236
95% Adjusted-CLT UCL (Chen-1995)	4.406	97.5% Chebyshev (MVUE) UCL	8.379
95% Modified-t UCL (Johnson-1978)	4.507	99% Chebyshev (MVUE) UCL	10.62

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.992	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.042		
MLE of Mean	4.161		
MLE of Standard Deviation	2.083		
nu star	239.5		
Approximate Chi Square Value (.05)	204.7	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	4.512
Adjusted Chi Square Value	202.9	95% Jackknife UCL	4.524
		95% Standard Bootstrap UCL	4.499
Anderson-Darling Test Statistic	6.528	95% Bootstrap-t UCL	4.443
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	4.431
Kolmogorov-Smirnov Test Statistic	0.463	95% Percentile Bootstrap UCL	4.482
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	4.43
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.091
		97.5% Chebyshev(Mean, Sd) UCL	5.493
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.282
95% Approximate Gamma UCL	4.869		
95% Adjusted Gamma UCL	4.914		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	5.091
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	10	Maximum of Log Data	2.303
Mean	7.992	Mean of log Data	1.214
Median	10	SD of log Data	2.216
SD	4.042		
Coefficient of Variation	0.506		
Skewness	-1.578		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.497	Shapiro Wilk Test Statistic	0.506
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.245	95% H-UCL	228.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	105.5
95% Adjusted-CLT UCL (Chen-1995)	8.978	97.5% Chebyshev (MVUE) UCL	137.8
95% Modified-t UCL (Johnson-1978)	9.21	99% Chebyshev (MVUE) UCL	201.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.651	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.27		
MLE of Mean	7.992		
MLE of Standard Deviation	9.901		
nu star	39.09		
Approximate Chi Square Value (.05)	25.77	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	9.205
Adjusted Chi Square Value	25.14	95% Jackknife UCL	9.245
		95% Standard Bootstrap UCL	9.154
Anderson-Darling Test Statistic	8.554	95% Bootstrap-t UCL	9.101
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	9.013
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	9.005
Kolmogorov-Smirnov 5% Critical Value	0.167	95% BCA Bootstrap UCL	8.986
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.21
		97.5% Chebyshev(Mean, Sd) UCL	12.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.33
95% Approximate Gamma UCL	12.12		
95% Adjusted Gamma UCL	12.42		

Potential UCL to Use	Use 97.5% Chebyshev (Mean, Sd) UCL	12.6
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0078	Minimum of Log Data	-4.854
Maximum	0.0284	Maximum of Log Data	-3.561
Mean	0.0181	Mean of log Data	-4.025
Median	0.0181	SD of log Data	0.177
SD	0.0027		
Coefficient of Variation	0.149		
Skewness	#######		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.362	Shapiro Wilk Test Statistic	0.333
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0189	95% H-UCL	0.0192
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0207
95% Adjusted-CLT UCL (Chen-1995)	0.0189	97.5% Chebyshev (MVUE) UCL	0.0218
95% Modified-t UCL (Johnson-1978)	0.0189	99% Chebyshev (MVUE) UCL	0.024

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	34.67	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.22E-04		
MLE of Mean	0.0181		
MLE of Standard Deviation	0.00307		
nu star	2080		
Approximate Chi Square Value (.05)	1975	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	0.0189
Adjusted Chi Square Value	1969	95% Jackknife UCL	0.0189
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	9.522	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0203
		97.5% Chebyshev(Mean, Sd) UCL	0.0212
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.023
95% Approximate Gamma UCL	0.0191		
95% Adjusted Gamma UCL	0.0191		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0189
	or 95% Modified-t UCL	0.0189

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	0.91	Minimum of Log Data	-0.0943
Maximum	49.25	Maximum of Log Data	3.897
Mean	17.16	Mean of log Data	2.53
Median	20	SD of log Data	0.965
SD	11.7		
Coefficient of Variation	0.682		
Skewness	1.224		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Test Statistic	0.82
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20.79	95% H-UCL	30.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.7
95% Adjusted-CLT UCL (Chen-1995)	21.18	97.5% Chebyshev (MVUE) UCL	44.11
95% Modified-t UCL (Johnson-1978)	20.87	99% Chebyshev (MVUE) UCL	58.68

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.598	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.74		
MLE of Mean	17.16		
MLE of Standard Deviation	13.57		
nu star	95.85		
Approximate Chi Square Value (.05)	74.27	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	20.67
Adjusted Chi Square Value	73.18	95% Jackknife UCL	20.79
		95% Standard Bootstrap UCL	20.56
Anderson-Darling Test Statistic	1.483	95% Bootstrap-t UCL	21.34
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	22.3
Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL	20.91
Kolmogorov-Smirnov 5% Critical Value	0.163	95% BCA Bootstrap UCL	21.04
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.47
		97.5% Chebyshev(Mean, Sd) UCL	30.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	38.41
95% Approximate Gamma UCL	22.14		
95% Adjusted Gamma UCL	22.47		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	26.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.044	Minimum of Log Data	-3.124
Maximum	0.161	Maximum of Log Data	-1.826
Mean	0.109	Mean of log Data	-2.23
Median	0.109	SD of log Data	0.184
SD	0.0156		
Coefficient of Variation	0.144		
Skewness	-1.272		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.405	Shapiro Wilk Test Statistic	0.348
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.114	95% H-UCL	0.116
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.125
95% Adjusted-CLT UCL (Chen-1995)	0.113	97.5% Chebyshev (MVUE) UCL	0.132
95% Modified-t UCL (Johnson-1978)	0.114	99% Chebyshev (MVUE) UCL	0.146

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	33.55	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00325		
MLE of Mean	0.109		
MLE of Standard Deviation	0.0188		
nu star	2013		
Approximate Chi Square Value (.05)	1910	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	0.114
Adjusted Chi Square Value	1904	95% Jackknife UCL	0.114
		95% Standard Bootstrap UCL	0.114
Anderson-Darling Test Statistic	8.842	95% Bootstrap-t UCL	0.113
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.114
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	0.113
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	0.112
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.121
		97.5% Chebyshev(Mean, Sd) UCL	0.127
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.137
95% Approximate Gamma UCL	0.115		
95% Adjusted Gamma UCL	0.115		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.114
	or 95% Modified-t UCL	0.114

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-238

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.88	Minimum of Log Data	-0.128
Maximum	3.77	Maximum of Log Data	1.327
Mean	2.667	Mean of log Data	0.963
Median	2.667	SD of log Data	0.219
SD	0.41		
Coefficient of Variation	0.154		
Skewness	-2.165		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.42	Shapiro Wilk Test Statistic	0.338
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.794	95% H-UCL	2.883
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.153
95% Adjusted-CLT UCL (Chen-1995)	2.758	97.5% Chebyshev (MVUE) UCL	3.357
95% Modified-t UCL (Johnson-1978)	2.789	99% Chebyshev (MVUE) UCL	3.757

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.44	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.105		
MLE of Mean	2.667		
MLE of Standard Deviation	0.529		
nu star	1526		
Approximate Chi Square Value (.05)	1437	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	2.79
Adjusted Chi Square Value	1432	95% Jackknife UCL	2.794
		95% Standard Bootstrap UCL	2.79
Anderson-Darling Test Statistic	8.669	95% Bootstrap-t UCL	2.765
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	2.783
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	2.786
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	2.749
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.993
		97.5% Chebyshev(Mean, Sd) UCL	3.134
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.412
95% Approximate Gamma UCL	2.833		
95% Adjusted Gamma UCL	2.843		

Potential UCL to Use		
	Use 95% Student's-t UCL	2.794
	or 95% Modified-t UCL	2.789

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	200-01.wst		
Full Precision	OFF		
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Antimony

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Cesium-137

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.19	Minimum of Log Data	-1.661
Maximum	0.9	Maximum of Log Data	-0.105
Mean	0.545	Mean of log Data	-0.625
Median	0.545	SD of log Data	0.216
SD	0.0932		
Coefficient of Variation	0.171		
Skewness	-9.49E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.362	Shapiro Wilk Test Statistic	0.324
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.574	95% H-UCL	0.588
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.642
95% Adjusted-CLT UCL (Chen-1995)	0.573	97.5% Chebyshev (MVUE) UCL	0.683
95% Modified-t UCL (Johnson-1978)	0.574	99% Chebyshev (MVUE) UCL	0.764

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	24.62	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0221		
MLE of Mean	0.545		
MLE of Standard Deviation	0.11		
nu star	1477		
Approximate Chi Square Value (.05)	1389	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	0.573
Adjusted Chi Square Value	1384	95% Jackknife UCL	0.574
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	9.543	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.619
		97.5% Chebyshev(Mean, Sd) UCL	0.651
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.714
95% Approximate Gamma UCL	0.58		
95% Adjusted Gamma UCL	0.582		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.574
	or 95% Modified-t UCL	0.574

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	12.4	Minimum of Log Data	2.518
Maximum	85	Maximum of Log Data	4.443
Mean	69.64	Mean of log Data	4.168
Median	85	SD of log Data	0.451
SD	22.06		
Coefficient of Variation	0.317		
Skewness	-1.069		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.714	Shapiro Wilk Test Statistic	0.674
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	76.48	95% H-UCL	83.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.66
95% Adjusted-CLT UCL (Chen-1995)	75.42	97.5% Chebyshev (MVUE) UCL	109.1
95% Modified-t UCL (Johnson-1978)	76.35	99% Chebyshev (MVUE) UCL	131.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.13	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.36		
MLE of Mean	69.64		
MLE of Standard Deviation	28.12		
nu star	367.8		
Approximate Chi Square Value (.05)	324.4	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	76.26
Adjusted Chi Square Value	322	95% Jackknife UCL	76.48
		95% Standard Bootstrap UCL	76.09
Anderson-Darling Test Statistic	3.839	95% Bootstrap-t UCL	75.51
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	75.25
Kolmogorov-Smirnov Test Statistic	0.38	95% Percentile Bootstrap UCL	76.19
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	75.48
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.19
		97.5% Chebyshev(Mean, Sd) UCL	94.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.7
95% Approximate Gamma UCL	78.96		
95% Adjusted Gamma UCL	79.54		

Potential UCL to Use		
	Use 95% Student's-t UCL	76.48
	or 95% Modified-t UCL	76.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0168	Minimum of Log Data	-4.086
Maximum	10	Maximum of Log Data	2.303
Mean	9.558	Mean of log Data	2.076
Median	10	SD of log Data	1.166
SD	1.899		
Coefficient of Variation	0.199		
Skewness	-4.794		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.26	Shapiro Wilk Test Statistic	0.204
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.15	95% H-UCL	28.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.93
95% Adjusted-CLT UCL (Chen-1995)	9.804	97.5% Chebyshev (MVUE) UCL	39.18
95% Modified-t UCL (Johnson-1978)	10.1	99% Chebyshev (MVUE) UCL	53.41

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.649	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.608		
MLE of Mean	9.558		
MLE of Standard Deviation	5.873		
nu star	158.9		
Approximate Chi Square Value (.05)	130.8	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	10.13
Adjusted Chi Square Value	129.3	95% Jackknife UCL	10.15
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	10.84	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.541	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.07
		97.5% Chebyshev(Mean, Sd) UCL	11.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.01
95% Approximate Gamma UCL	11.61		
95% Adjusted Gamma UCL	11.75		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.07
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	30	Number of Distinct Observations	15
Raw Statistics		Log-transformed Statistics	
Minimum	10.8	Minimum of Log Data	2.38
Maximum	259.5	Maximum of Log Data	5.559
Mean	87.01	Mean of log Data	4.328
Median	65	SD of log Data	0.547
SD	51.45		
Coefficient of Variation	0.591		
Skewness	2.028		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.672	Shapiro Wilk Test Statistic	0.725
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	103	95% H-UCL	107.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	127.6
95% Adjusted-CLT UCL (Chen-1995)	106.2	97.5% Chebyshev (MVUE) UCL	145
95% Modified-t UCL (Johnson-1978)	103.5	99% Chebyshev (MVUE) UCL	179.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.423	Data do not follow a Discernable Distribution (0.05)	
Theta Star	25.42		
MLE of Mean	87.01		
MLE of Standard Deviation	47.03		
nu star	205.4		
Approximate Chi Square Value (.05)	173.2	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	102.5
Adjusted Chi Square Value	171.5	95% Jackknife UCL	103
		95% Standard Bootstrap UCL	101.9
Anderson-Darling Test Statistic	3.936	95% Bootstrap-t UCL	109.3
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	106.9
Kolmogorov-Smirnov Test Statistic	0.318	95% Percentile Bootstrap UCL	102.6
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	107.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	128
		97.5% Chebyshev(Mean, Sd) UCL	145.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	180.5
95% Approximate Gamma UCL	103.2		
95% Adjusted Gamma UCL	104.2		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	128

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.3	Minimum of Log Data	-1.204
Maximum	5	Maximum of Log Data	1.609
Mean	4.493	Mean of log Data	1.437
Median	4.493	SD of log Data	0.513
SD	0.914		
Coefficient of Variation	0.204		
Skewness	-3.814		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.48	Shapiro Wilk Test Statistic	0.31
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.777	95% H-UCL	5.785
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.815
95% Adjusted-CLT UCL (Chen-1995)	4.643	97.5% Chebyshev (MVUE) UCL	7.698
95% Modified-t UCL (Johnson-1978)	4.757	99% Chebyshev (MVUE) UCL	9.431

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.021	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.64		
MLE of Mean	4.493		
MLE of Standard Deviation	1.696		
nu star	421.3		
Approximate Chi Square Value (.05)	374.7	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	4.767
Adjusted Chi Square Value	372.2	95% Jackknife UCL	4.777
		95% Standard Bootstrap UCL	4.765
Anderson-Darling Test Statistic	7.405	95% Bootstrap-t UCL	4.699
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	4.676
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	4.73
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	4.696
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.221
		97.5% Chebyshev(Mean, Sd) UCL	5.535
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.154
95% Approximate Gamma UCL	5.051		
95% Adjusted Gamma UCL	5.086		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.221
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	6.62	Minimum of Log Data	1.89
Maximum	49.25	Maximum of Log Data	3.897
Mean	19.04	Mean of log Data	2.816
Median	20	SD of log Data	0.524
SD	10.38		
Coefficient of Variation	0.545		
Skewness	1.574		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.766	Shapiro Wilk Test Statistic	0.859
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.26	95% H-UCL	23.23
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.41
95% Adjusted-CLT UCL (Chen-1995)	22.74	97.5% Chebyshev (MVUE) UCL	31.02
95% Modified-t UCL (Johnson-1978)	22.35	99% Chebyshev (MVUE) UCL	38.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.606	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.28		
MLE of Mean	19.04		
MLE of Standard Deviation	10.03		
nu star	216.4		
Approximate Chi Square Value (.05)	183.3	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	22.16
Adjusted Chi Square Value	181.6	95% Jackknife UCL	22.26
		95% Standard Bootstrap UCL	22.15
Anderson-Darling Test Statistic	2.127	95% Bootstrap-t UCL	23.66
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	24.69
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	22.34
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	22.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	27.3
		97.5% Chebyshev(Mean, Sd) UCL	30.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.89
95% Approximate Gamma UCL	22.47		
95% Adjusted Gamma UCL	22.69		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	27.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.122	Minimum of Log Data	-2.104
Maximum	0.161	Maximum of Log Data	-1.826
Mean	0.142	Mean of log Data	-1.956
Median	0.142	SD of log Data	0.0365
SD	0.00512		
Coefficient of Variation	0.0362		
Skewness	-4.36E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.362	Shapiro Wilk Test Statistic	0.36
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.143	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.146
95% Adjusted-CLT UCL (Chen-1995)	0.143	97.5% Chebyshev (MVUE) UCL	0.147
95% Modified-t UCL (Johnson-1978)	0.143	99% Chebyshev (MVUE) UCL	0.151

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	704.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.01E-04		
MLE of Mean	0.142		
MLE of Standard Deviation	0.00533		
nu star	42255		
Approximate Chi Square Value (.05)	41778	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	0.143
Adjusted Chi Square Value	41751	95% Jackknife UCL	0.143
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	9.474	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.146
		97.5% Chebyshev(Mean, Sd) UCL	0.147
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.151
95% Approximate Gamma UCL	0.143		
95% Adjusted Gamma UCL	0.143		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.143
	or 95% Modified-t UCL	0.143

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-238

General Statistics

Number of Valid Observations	30	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	3.35	Minimum of Log Data	1.209
Maximum	3.77	Maximum of Log Data	1.327
Mean	3.56	Mean of log Data	1.27
Median	3.56	SD of log Data	0.0155
SD	0.0551		
Coefficient of Variation	0.0155		
Skewness	-7.76E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.362	Shapiro Wilk Test Statistic	0.362
Shapiro Wilk Critical Value	0.927	Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.577	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.604
95% Adjusted-CLT UCL (Chen-1995)	3.577	97.5% Chebyshev (MVUE) UCL	3.623
95% Modified-t UCL (Johnson-1978)	3.577	99% Chebyshev (MVUE) UCL	3.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3873	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.19E-04		
MLE of Mean	3.56		
MLE of Standard Deviation	0.0572		
nu star	232386		
Approximate Chi Square Value (.05)	231265	Nonparametric Statistics	
Adjusted Level of Significance	0.041	95% CLT UCL	3.577
Adjusted Chi Square Value	231201	95% Jackknife UCL	3.577
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	9.894	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.528	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.604
		97.5% Chebyshev(Mean, Sd) UCL	3.623
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.66
95% Approximate Gamma UCL	3.577		
95% Adjusted Gamma UCL	3.578		

Potential UCL to Use		
	Use 95% Student's-t UCL	3.577
	or 95% Modified-t UCL	3.577

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	217-01.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	11	Maximum of Log Data	2.398
Mean	8.446	Mean of log Data	2.106
Median	8.34	SD of log Data	0.248
SD	1.975		
Coefficient of Variation	0.234		
Skewness	-0.202		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.939	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.423	95% H-UCL	9.691
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.01
95% Adjusted-CLT UCL (Chen-1995)	9.314	97.5% Chebyshev (MVUE) UCL	12.12
95% Modified-t UCL (Johnson-1978)	9.417	99% Chebyshev (MVUE) UCL	14.29

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.27	Data appear Normal at 5% Significance Level	
Theta Star	0.592		
MLE of Mean	8.446		
MLE of Standard Deviation	2.236		
nu star	371.1		
Approximate Chi Square Value (.05)	327.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.347
Adjusted Chi Square Value	321.6	95% Jackknife UCL	9.423
		95% Standard Bootstrap UCL	9.327
Anderson-Darling Test Statistic	0.367	95% Bootstrap-t UCL	9.346
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	9.308
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	9.29
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	9.329
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.83
		97.5% Chebyshev(Mean, Sd) UCL	11.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.9
95% Approximate Gamma UCL	9.572		
95% Adjusted Gamma UCL	9.746		

Potential UCL to Use		
Use 95% Student's-t UCL		9.423

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	39.6	Minimum of Log Data	3.679
Maximum	88.9	Maximum of Log Data	4.488
Mean	56.49	Mean of log Data	3.993
Median	53.32	SD of log Data	0.288
SD	17.83		
Coefficient of Variation	0.316		
Skewness	1.11		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.785	Shapiro Wilk Test Statistic	0.84
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.3	95% H-UCL	66.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	76.16
95% Adjusted-CLT UCL (Chen-1995)	66.25	97.5% Chebyshev (MVUE) UCL	84.73
95% Modified-t UCL (Johnson-1978)	65.56	99% Chebyshev (MVUE) UCL	101.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.624	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.87		
MLE of Mean	56.49		
MLE of Standard Deviation	18.21		
nu star	250.2		
Approximate Chi Square Value (.05)	214.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	64.62
Adjusted Chi Square Value	209.9	95% Jackknife UCL	65.3
		95% Standard Bootstrap UCL	64.29
Anderson-Darling Test Statistic	1.027	95% Bootstrap-t UCL	68.06
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	63.84
Kolmogorov-Smirnov Test Statistic	0.29	95% Percentile Bootstrap UCL	64.49
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	66.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.05
		97.5% Chebyshev(Mean, Sd) UCL	87.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	105.7
95% Approximate Gamma UCL	65.87		
95% Adjusted Gamma UCL	67.34		

Potential UCL to Use		
	Use 95% Student's-t UCL	65.3
	or 95% Modified-t UCL	65.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	7.2	Minimum of Log Data	1.974
Maximum	25	Maximum of Log Data	3.219
Mean	14.53	Mean of log Data	2.645
Median	14.53	SD of log Data	0.264
SD	3.799		
Coefficient of Variation	0.261		
Skewness	1.296		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.647	Shapiro Wilk Test Statistic	0.671
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.41	95% H-UCL	16.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.22
95% Adjusted-CLT UCL (Chen-1995)	16.67	97.5% Chebyshev (MVUE) UCL	21.24
95% Modified-t UCL (Johnson-1978)	16.47	99% Chebyshev (MVUE) UCL	25.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.59	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.154		
MLE of Mean	14.53		
MLE of Standard Deviation	4.096		
nu star	327.4		
Approximate Chi Square Value (.05)	286.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	16.27
Adjusted Chi Square Value	281	95% Jackknife UCL	16.41
		95% Standard Bootstrap UCL	16.23
Anderson-Darling Test Statistic	2.361	95% Bootstrap-t UCL	16.69
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	19.49
Kolmogorov-Smirnov Test Statistic	0.39	95% Percentile Bootstrap UCL	16.14
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	16.38
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.13
		97.5% Chebyshev(Mean, Sd) UCL	21.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.02
95% Approximate Gamma UCL	16.61		
95% Adjusted Gamma UCL	16.93		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.41
	or 95% Modified-t UCL	16.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	155.6	Minimum of Log Data	5.047
Maximum	1956	Maximum of Log Data	7.579
Mean	653.1	Mean of log Data	6.185
Median	401.3	SD of log Data	0.784
SD	564.5		
Coefficient of Variation	0.864		
Skewness	1.536		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	932.1	95% H-UCL	1162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1284
95% Adjusted-CLT UCL (Chen-1995)	981.9	97.5% Chebyshev (MVUE) UCL	1562
95% Modified-t UCL (Johnson-1978)	943.3	99% Chebyshev (MVUE) UCL	2107

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.464	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	446.2		
MLE of Mean	653.1		
MLE of Standard Deviation	539.8		
nu star	38.05		
Approximate Chi Square Value (.05)	24.93	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	910.6
Adjusted Chi Square Value	23.42	95% Jackknife UCL	932.1
		95% Standard Bootstrap UCL	896.8
Anderson-Darling Test Statistic	0.444	95% Bootstrap-t UCL	1133
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	1296
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	908.8
Kolmogorov-Smirnov 5% Critical Value	0.24	95% BCA Bootstrap UCL	961.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1336
		97.5% Chebyshev(Mean, Sd) UCL	1631
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2211
95% Approximate Gamma UCL	997		
95% Adjusted Gamma UCL	1061		

Potential UCL to Use		Use 95% Approximate Gamma UCL	997

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0101	Minimum of Log Data	-4.595
Maximum	10	Maximum of Log Data	2.303
Mean	8.029	Mean of log Data	1.24
Median	10	SD of log Data	2.454
SD	3.708		
Coefficient of Variation	0.462		
Skewness	-1.859		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.588	Shapiro Wilk Test Statistic	0.484
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.862	95% H-UCL	4183
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	157.5
95% Adjusted-CLT UCL (Chen-1995)	9.154	97.5% Chebyshev (MVUE) UCL	209.3
95% Modified-t UCL (Johnson-1978)	9.774	99% Chebyshev (MVUE) UCL	311.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.601	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.36		
MLE of Mean	8.029		
MLE of Standard Deviation	10.36		
nu star	15.62		
Approximate Chi Square Value (.05)	7.697	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.721
Adjusted Chi Square Value	6.918	95% Jackknife UCL	9.862
		95% Standard Bootstrap UCL	9.698
Anderson-Darling Test Statistic	3.667	95% Bootstrap-t UCL	9.4
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	9.253
Kolmogorov-Smirnov Test Statistic	0.459	95% Percentile Bootstrap UCL	9.565
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	9.232
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.51
		97.5% Chebyshev(Mean, Sd) UCL	14.45
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.26
95% Approximate Gamma UCL	16.3		
95% Adjusted Gamma UCL	18.13		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.26
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	11.4	Minimum of Log Data	2.434
Maximum	130.4	Maximum of Log Data	4.871
Mean	70.92	Mean of log Data	4.115
Median	65	SD of log Data	0.649
SD	32.7		
Coefficient of Variation	0.461		
Skewness	0.154		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.784
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	87.08	95% H-UCL	116.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	134.9
95% Adjusted-CLT UCL (Chen-1995)	86.25	97.5% Chebyshev (MVUE) UCL	161.2
95% Modified-t UCL (Johnson-1978)	87.15	99% Chebyshev (MVUE) UCL	212.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.805	Data appear Normal at 5% Significance Level	
Theta Star	25.28		
MLE of Mean	70.92		
MLE of Standard Deviation	42.34		
nu star	72.93		
Approximate Chi Square Value (.05)	54.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	85.84
Adjusted Chi Square Value	51.98	95% Jackknife UCL	87.08
		95% Standard Bootstrap UCL	85.14
Anderson-Darling Test Statistic	1.013	95% Bootstrap-t UCL	88.22
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	90.33
Kolmogorov-Smirnov Test Statistic	0.321	95% Percentile Bootstrap UCL	85.45
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	85.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	110.5
		97.5% Chebyshev(Mean, Sd) UCL	127.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	161.2
95% Approximate Gamma UCL	95.31		
95% Adjusted Gamma UCL	99.51		

Potential UCL to Use		Use 95% Student's-t UCL	87.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.016	Minimum of Log Data	-4.135
Maximum	13.45	Maximum of Log Data	2.599
Mean	8.097	Mean of log Data	0.907
Median	10	SD of log Data	2.743
SD	4.714		
Coefficient of Variation	0.582		
Skewness	-1.244		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.684	Shapiro Wilk Test Statistic	0.569
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.43	95% H-UCL	16757
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	200.5
95% Adjusted-CLT UCL (Chen-1995)	9.766	97.5% Chebyshev (MVUE) UCL	267.7
95% Modified-t UCL (Johnson-1978)	10.35	99% Chebyshev (MVUE) UCL	399.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.61		
MLE of Mean	8.097		
MLE of Standard Deviation	11.94		
nu star	11.96		
Approximate Chi Square Value (.05)	5.198	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.25
Adjusted Chi Square Value	4.579	95% Jackknife UCL	10.43
		95% Standard Bootstrap UCL	10.18
Anderson-Darling Test Statistic	3.234	95% Bootstrap-t UCL	10.18
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	9.739
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	10.03
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	9.763
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.8
		97.5% Chebyshev(Mean, Sd) UCL	16.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.11
95% Approximate Gamma UCL	18.62		
95% Adjusted Gamma UCL	21.14		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	21.11
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.92	Minimum of Log Data	-0.083
Maximum	1.27	Maximum of Log Data	0.239
Mean	1.057	Mean of log Data	0.0528
Median	1.057	SD of log Data	0.0699
SD	0.0764		
Coefficient of Variation	0.0723		
Skewness	1.48		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.648	Shapiro Wilk Test Statistic	0.668
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.094	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.146
95% Adjusted-CLT UCL (Chen-1995)	1.101	97.5% Chebyshev (MVUE) UCL	1.185
95% Modified-t UCL (Johnson-1978)	1.096	99% Chebyshev (MVUE) UCL	1.261

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	167.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0063		
MLE of Mean	1.057		
MLE of Standard Deviation	0.0817		
nu star	4349		
Approximate Chi Square Value (.05)	4197	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	1.092
Adjusted Chi Square Value	4175	95% Jackknife UCL	1.094
		95% Standard Bootstrap UCL	1.091
Anderson-Darling Test Statistic	2.361	95% Bootstrap-t UCL	1.103
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	1.302
Kolmogorov-Smirnov Test Statistic	0.414	95% Percentile Bootstrap UCL	1.091
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	1.095
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.149
		97.5% Chebyshev(Mean, Sd) UCL	1.189
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.268
95% Approximate Gamma UCL	1.095		
95% Adjusted Gamma UCL	1.101		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.094
	or 95% Modified-t UCL	1.096

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	16.3	Minimum of Log Data	2.791
Maximum	43.8	Maximum of Log Data	3.78
Mean	27.03	Mean of log Data	3.276
Median	27.03	SD of log Data	0.213
SD	6.005		
Coefficient of Variation	0.222		
Skewness	1.481		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.648	Shapiro Wilk Test Statistic	0.689
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30	95% H-UCL	30.33
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.04
95% Adjusted-CLT UCL (Chen-1995)	30.5	97.5% Chebyshev (MVUE) UCL	37.07
95% Modified-t UCL (Johnson-1978)	30.12	99% Chebyshev (MVUE) UCL	43.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.477		
MLE of Mean	27.03		
MLE of Standard Deviation	6.319		
nu star	475.8		
Approximate Chi Square Value (.05)	426.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	29.77
Adjusted Chi Square Value	419.6	95% Jackknife UCL	30
		95% Standard Bootstrap UCL	29.66
Anderson-Darling Test Statistic	2.309	95% Bootstrap-t UCL	30.68
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	46.31
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	29.61
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	30.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.29
		97.5% Chebyshev(Mean, Sd) UCL	37.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.6
95% Approximate Gamma UCL	30.18		
95% Adjusted Gamma UCL	30.66		

Potential UCL to Use		
	Use 95% Student's-t UCL	30
	or 95% Modified-t UCL	30.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	217-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

1,1-Dichloroethene

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.006	Minimum of Log Data	-5.12
Maximum	0.03	Maximum of Log Data	-3.51
Mean	0.017	Mean of log Data	-4.11
Median	0.017	SD of log Data	0.296
SD	0.0043		
Coefficient of Variation	0.252		
Skewness	0.772		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.538	Shapiro Wilk Test Statistic	0.504
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0188	95% H-UCL	0.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.023
95% Adjusted-CLT UCL (Chen-1995)	0.0189	97.5% Chebyshev (MVUE) UCL	0.025
95% Modified-t UCL (Johnson-1978)	0.0188	99% Chebyshev (MVUE) UCL	0.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0014		
MLE of Mean	0.017		
MLE of Standard Deviation	0.0049		
nu star	403.5		
Approximate Chi Square Value (.05)	358	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.019
Adjusted Chi Square Value	353.5	95% Jackknife UCL	0.019
		95% Standard Bootstrap UCL	0.019
Anderson-Darling Test Statistic	4.091	95% Bootstrap-t UCL	0.019
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.02
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	0.019
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.019
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.022
		97.5% Chebyshev(Mean, Sd) UCL	0.024
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.027
95% Approximate Gamma UCL	0.0192		
95% Adjusted Gamma UCL	0.0194		
Potential UCL to Use		Use 95% Student's-t UCL	0.019
		or 95% Modified-t UCL	0.019

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Aluminum

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	3260	Minimum of Log Data	8.089
Maximum	14400	Maximum of Log Data	9.575
Mean	9147	Mean of log Data	9.076
Median	9147	SD of log Data	0.331
SD	2569		
Coefficient of Variation	0.281		
Skewness	-0.041		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.854	Shapiro Wilk Test Statistic	0.784
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10235	95% H-UCL	10801
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12483
95% Adjusted-CLT UCL (Chen-1995)	10165	97.5% Chebyshev (MVUE) UCL	13900
95% Modified-t UCL (Johnson-1978)	10234	99% Chebyshev (MVUE) UCL	16685

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.329	Data do not follow a Discernable Distribution (0.05)	
Theta Star	980.5		
MLE of Mean	9147		
MLE of Standard Deviation	2995		
nu star	317.2		
Approximate Chi Square Value (.05)	276.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	10172
Adjusted Chi Square Value	273	95% Jackknife UCL	10235
		95% Standard Bootstrap UCL	10146
Anderson-Darling Test Statistic	1.565	95% Bootstrap-t UCL	10274
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	10313
Kolmogorov-Smirnov Test Statistic	0.304	95% Percentile Bootstrap UCL	10142
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	10186
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11863
		97.5% Chebyshev(Mean, Sd) UCL	13038
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15346
95% Approximate Gamma UCL	10477		
95% Adjusted Gamma UCL	10628		

Potential UCL to Use		
	Use 95% Student's-t UCL	10235
	or 95% Modified-t UCL	10234

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.39	Minimum of Log Data	-0.94
Maximum	20	Maximum of Log Data	2.996
Mean	4.066	Mean of log Data	1.012
Median	4.066	SD of log Data	0.972
SD	4.353		
Coefficient of Variation	1.071		
Skewness	3.333		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.792
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.909	95% H-UCL	8.355
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.044
95% Adjusted-CLT UCL (Chen-1995)	6.714	97.5% Chebyshev (MVUE) UCL	11.12
95% Modified-t UCL (Johnson-1978)	6.051	99% Chebyshev (MVUE) UCL	15.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.211	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.358		
MLE of Mean	4.066		
MLE of Standard Deviation	3.695		
nu star	41.16		
Approximate Chi Square Value (.05)	27.46	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	5.802
Adjusted Chi Square Value	26.29	95% Jackknife UCL	5.909
		95% Standard Bootstrap UCL	5.712
Anderson-Darling Test Statistic	1.83	95% Bootstrap-t UCL	7.824
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	13.26
Kolmogorov-Smirnov Test Statistic	0.33	95% Percentile Bootstrap UCL	5.985
Kolmogorov-Smirnov 5% Critical Value	0.213	95% BCA Bootstrap UCL	7.271
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.668
		97.5% Chebyshev(Mean, Sd) UCL	10.66
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.57
95% Approximate Gamma UCL	6.095		
95% Adjusted Gamma UCL	6.366		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.668

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	4.9	Minimum of Log Data	1.589
Maximum	21.3	Maximum of Log Data	3.059
Mean	8.322	Mean of log Data	2.04
Median	7.03	SD of log Data	0.384
SD	3.992		
Coefficient of Variation	0.48		
Skewness	2.337		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.751	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.01	95% H-UCL	9.961
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.65
95% Adjusted-CLT UCL (Chen-1995)	10.5	97.5% Chebyshev (MVUE) UCL	13.13
95% Modified-t UCL (Johnson-1978)	10.1	99% Chebyshev (MVUE) UCL	16.03

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.387	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.545		
MLE of Mean	8.322		
MLE of Standard Deviation	3.585		
nu star	183.2		
Approximate Chi Square Value (.05)	152.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	9.914
Adjusted Chi Square Value	150	95% Jackknife UCL	10.01
		95% Standard Bootstrap UCL	9.828
Anderson-Darling Test Statistic	0.684	95% Bootstrap-t UCL	11.26
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	16.83
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	9.944
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	10.53
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.54
		97.5% Chebyshev(Mean, Sd) UCL	14.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.96
95% Approximate Gamma UCL	9.972		
95% Adjusted Gamma UCL	10.16		

Potential UCL to Use		Use 95% Approximate Gamma UCL	9.972

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.3	Minimum of Log Data	-1.2
Maximum	0.88	Maximum of Log Data	-0.13
Mean	0.537	Mean of log Data	-0.64
Median	0.537	SD of log Data	0.207
SD	0.113		
Coefficient of Variation	0.21		
Skewness	1.285		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.715	Shapiro Wilk Test Statistic	0.74
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.585	95% H-UCL	0.591
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.656
95% Adjusted-CLT UCL (Chen-1995)	0.591	97.5% Chebyshev (MVUE) UCL	0.707
95% Modified-t UCL (Johnson-1978)	0.586	99% Chebyshev (MVUE) UCL	0.808

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0258		
MLE of Mean	0.537		
MLE of Standard Deviation	0.118		
nu star	706.6		
Approximate Chi Square Value (.05)	646	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.582
Adjusted Chi Square Value	639.9	95% Jackknife UCL	0.585
		95% Standard Bootstrap UCL	0.581
Anderson-Darling Test Statistic	2.291	95% Bootstrap-t UCL	0.594
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.754
Kolmogorov-Smirnov Test Statistic	0.356	95% Percentile Bootstrap UCL	0.581
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.588
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.656
		97.5% Chebyshev(Mean, Sd) UCL	0.708
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.809
95% Approximate Gamma UCL	0.588		
95% Adjusted Gamma UCL	0.593		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.585
	or 95% Modified-t UCL	0.586

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	13.9	Minimum of Log Data	2.632
Maximum	108.2	Maximum of Log Data	4.684
Mean	52.16	Mean of log Data	3.821
Median	44.01	SD of log Data	0.553
SD	26.94		
Coefficient of Variation	0.517		
Skewness	0.705		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.883	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.57	95% H-UCL	70.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	84.6
95% Adjusted-CLT UCL (Chen-1995)	64.1	97.5% Chebyshev (MVUE) UCL	98.44
95% Modified-t UCL (Johnson-1978)	63.75	99% Chebyshev (MVUE) UCL	125.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.254	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	16.03		
MLE of Mean	52.16		
MLE of Standard Deviation	28.92		
nu star	110.6		
Approximate Chi Square Value (.05)	87.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	62.91
Adjusted Chi Square Value	85.18	95% Jackknife UCL	63.57
		95% Standard Bootstrap UCL	62.32
Anderson-Darling Test Statistic	0.671	95% Bootstrap-t UCL	65.55
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	63.84
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	63.06
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	63.98
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.64
		97.5% Chebyshev(Mean, Sd) UCL	92.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117.2
95% Approximate Gamma UCL	66.06		
95% Adjusted Gamma UCL	67.74		

Potential UCL to Use		Use 95% Approximate Gamma UCL	66.06

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6.3	Minimum of Log Data	1.841
Maximum	190	Maximum of Log Data	5.247
Mean	39.79	Mean of log Data	3.379
Median	39.79	SD of log Data	0.793
SD	40.8		
Coefficient of Variation	1.026		
Skewness	3.412		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.524	Shapiro Wilk Test Statistic	0.825
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.06	95% H-UCL	64.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	74.64
95% Adjusted-CLT UCL (Chen-1995)	64.81	97.5% Chebyshev (MVUE) UCL	89.95
95% Modified-t UCL (Johnson-1978)	58.43	99% Chebyshev (MVUE) UCL	120

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.515	Data do not follow a Discernable Distribution (0.05)	
Theta Star	26.26		
MLE of Mean	39.79		
MLE of Standard Deviation	32.33		
nu star	51.5		
Approximate Chi Square Value (.05)	36.02	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	56.06
Adjusted Chi Square Value	34.67	95% Jackknife UCL	57.06
		95% Standard Bootstrap UCL	55.95
Anderson-Darling Test Statistic	1.673	95% Bootstrap-t UCL	77.83
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	125.2
Kolmogorov-Smirnov Test Statistic	0.342	95% Percentile Bootstrap UCL	57.16
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	67.86
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.92
		97.5% Chebyshev(Mean, Sd) UCL	101.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	138.3
95% Approximate Gamma UCL	56.89		
95% Adjusted Gamma UCL	59.11		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	82.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	12458	Minimum of Log Data	9.43
Maximum	60384	Maximum of Log Data	11.01
Mean	24690	Mean of log Data	10.01
Median	18203	SD of log Data	0.455
SD	12790		
Coefficient of Variation	0.518		
Skewness	1.528		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30106	95% H-UCL	30912
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36585
95% Adjusted-CLT UCL (Chen-1995)	31021	97.5% Chebyshev (MVUE) UCL	41820
95% Modified-t UCL (Johnson-1978)	30297	99% Chebyshev (MVUE) UCL	52102

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.093	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	6032		
MLE of Mean	24690		
MLE of Standard Deviation	12203		
nu star	139.2		
Approximate Chi Square Value (.05)	112.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	29792
Adjusted Chi Square Value	110.4	95% Jackknife UCL	30106
		95% Standard Bootstrap UCL	29689
Anderson-Darling Test Statistic	0.71	95% Bootstrap-t UCL	31695
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	32709
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	29950
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	31034
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38211
		97.5% Chebyshev(Mean, Sd) UCL	44062
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	55554
95% Approximate Gamma UCL	30432		
95% Adjusted Gamma UCL	31115		

Potential UCL to Use		Use 95% Approximate Gamma UCL	30432

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	255.4	Minimum of Log Data	5.543
Maximum	2054	Maximum of Log Data	7.628
Mean	708.6	Mean of log Data	6.359
Median	544.1	SD of log Data	0.634
SD	516.7		
Coefficient of Variation	0.729		
Skewness	1.599		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.806	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	927.4	95% H-UCL	997.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1187
95% Adjusted-CLT UCL (Chen-1995)	966.6	97.5% Chebyshev (MVUE) UCL	1399
95% Modified-t UCL (Johnson-1978)	935.5	99% Chebyshev (MVUE) UCL	1816

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.183	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	324.6		
MLE of Mean	708.6		
MLE of Standard Deviation	479.6		
nu star	74.23		
Approximate Chi Square Value (.05)	55.39	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	914.7
Adjusted Chi Square Value	53.68	95% Jackknife UCL	927.4
		95% Standard Bootstrap UCL	918.5
Anderson-Darling Test Statistic	0.562	95% Bootstrap-t UCL	1066
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	1063
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	908.1
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	990.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1255
		97.5% Chebyshev(Mean, Sd) UCL	1491
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1955
95% Approximate Gamma UCL	949.6		
95% Adjusted Gamma UCL	979.8		

Potential UCL to Use		Use 95% Approximate Gamma UCL	949.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	0.0067	Minimum of Log Data	-5.01
Maximum	10	Maximum of Log Data	2.303
Mean	5.963	Mean of log Data	0.271
Median	9.2	SD of log Data	2.745
SD	4.771		
Coefficient of Variation	0.8		
Skewness	-0.44		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.693	Shapiro Wilk Test Statistic	0.722
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.983	95% H-UCL	3036
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.3
95% Adjusted-CLT UCL (Chen-1995)	7.734	97.5% Chebyshev (MVUE) UCL	160.3
95% Modified-t UCL (Johnson-1978)	7.963	99% Chebyshev (MVUE) UCL	238.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.393	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.17		
MLE of Mean	5.963		
MLE of Standard Deviation	9.512		
nu star	13.36		
Approximate Chi Square Value (.05)	6.138	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	7.866
Adjusted Chi Square Value	5.631	95% Jackknife UCL	7.983
		95% Standard Bootstrap UCL	7.785
Anderson-Darling Test Statistic	2.54	95% Bootstrap-t UCL	7.864
Anderson-Darling 5% Critical Value	0.813	95% Hall's Bootstrap UCL	7.541
Kolmogorov-Smirnov Test Statistic	0.363	95% Percentile Bootstrap UCL	7.777
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	7.793
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.01
		97.5% Chebyshev(Mean, Sd) UCL	13.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.48
95% Approximate Gamma UCL	12.98		
95% Adjusted Gamma UCL	14.15		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.48

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	12.6	Minimum of Log Data	2.534
Maximum	131.5	Maximum of Log Data	4.879
Mean	66.1	Mean of log Data	4.047
Median	65	SD of log Data	0.634
SD	29.96		
Coefficient of Variation	0.453		
Skewness	0.135		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.773
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	78.79	95% H-UCL	98.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	117.6
95% Adjusted-CLT UCL (Chen-1995)	78.31	97.5% Chebyshev (MVUE) UCL	138.7
95% Modified-t UCL (Johnson-1978)	78.83	99% Chebyshev (MVUE) UCL	180
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.033	Data appear Normal at 5% Significance Level	
Theta Star	21.79		
MLE of Mean	66.1		
MLE of Standard Deviation	37.95		
nu star	103.1		
Approximate Chi Square Value (.05)	80.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	78.05
Adjusted Chi Square Value	78.62	95% Jackknife UCL	78.79
		95% Standard Bootstrap UCL	77.43
Anderson-Darling Test Statistic	1.448	95% Bootstrap-t UCL	79.36
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	80.41
Kolmogorov-Smirnov Test Statistic	0.322	95% Percentile Bootstrap UCL	78.08
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	77.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	97.77
		97.5% Chebyshev(Mean, Sd) UCL	111.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	138.4
95% Approximate Gamma UCL	84.47		
95% Adjusted Gamma UCL	86.71		
Potential UCL to Use		Use 95% Student's-t UCL	78.79

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.012	Minimum of Log Data	-4.42
Maximum	16.09	Maximum of Log Data	2.778
Mean	7.576	Mean of log Data	0.742
Median	10	SD of log Data	2.607
SD	5.592		
Coefficient of Variation	0.738		
Skewness	-0.336		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Test Statistic	0.704
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.944	95% H-UCL	2317
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	143
95% Adjusted-CLT UCL (Chen-1995)	9.689	97.5% Chebyshev (MVUE) UCL	190.2
95% Modified-t UCL (Johnson-1978)	9.925	99% Chebyshev (MVUE) UCL	282.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.447	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.93		
MLE of Mean	7.576		
MLE of Standard Deviation	11.33		
nu star	15.21		
Approximate Chi Square Value (.05)	7.409	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	9.807
Adjusted Chi Square Value	6.844	95% Jackknife UCL	9.944
		95% Standard Bootstrap UCL	9.753
Anderson-Darling Test Statistic	2.437	95% Bootstrap-t UCL	9.706
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	9.586
Kolmogorov-Smirnov Test Statistic	0.391	95% Percentile Bootstrap UCL	9.77
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9.494
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.49
		97.5% Chebyshev(Mean, Sd) UCL	16.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.07
95% Approximate Gamma UCL	15.55		
95% Adjusted Gamma UCL	16.84		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	21.07

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.008	Minimum of Log Data	-4.83
Maximum	0.737	Maximum of Log Data	-0.31
Mean	0.233	Mean of log Data	-1.94
Median	0.233	SD of log Data	1.378
SD	0.164		
Coefficient of Variation	0.707		
Skewness	1.58		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.617
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.302	95% H-UCL	1.145
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.903
95% Adjusted-CLT UCL (Chen-1995)	0.314	97.5% Chebyshev (MVUE) UCL	1.148
95% Modified-t UCL (Johnson-1978)	0.305	99% Chebyshev (MVUE) UCL	1.629

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.006	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.231		
MLE of Mean	0.233		
MLE of Standard Deviation	0.232		
nu star	34.21		
Approximate Chi Square Value (.05)	21.83	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.298
Adjusted Chi Square Value	20.8	95% Jackknife UCL	0.302
		95% Standard Bootstrap UCL	0.296
Anderson-Darling Test Statistic	3.051	95% Bootstrap-t UCL	0.321
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	0.7
Kolmogorov-Smirnov Test Statistic	0.446	95% Percentile Bootstrap UCL	0.298
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	0.311
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.406
		97.5% Chebyshev(Mean, Sd) UCL	0.482
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.629
95% Approximate Gamma UCL	0.364		
95% Adjusted Gamma UCL	0.382		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.406

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	16.5	Minimum of Log Data	2.803
Maximum	37.9	Maximum of Log Data	3.635
Mean	26.41	Mean of log Data	3.253
Median	26.41	SD of log Data	0.213
SD	5.404		
Coefficient of Variation	0.205		
Skewness	0.193		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk Test Statistic	0.812
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	28.7	95% H-UCL	29.13
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	32.42
95% Adjusted-CLT UCL (Chen-1995)	28.64	97.5% Chebyshev (MVUE) UCL	35.01
95% Modified-t UCL (Johnson-1978)	28.71	99% Chebyshev (MVUE) UCL	40.11

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.15	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.311		
MLE of Mean	26.41		
MLE of Standard Deviation	5.884		
nu star	685.2		
Approximate Chi Square Value (.05)	625.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	28.57
Adjusted Chi Square Value	619.5	95% Jackknife UCL	28.7
		95% Standard Bootstrap UCL	28.5
Anderson-Darling Test Statistic	1.776	95% Bootstrap-t UCL	28.73
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	29.17
Kolmogorov-Smirnov Test Statistic	0.35	95% Percentile Bootstrap UCL	28.58
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	28.57
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	32.13
		97.5% Chebyshev(Mean, Sd) UCL	34.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	39.46
95% Approximate Gamma UCL	28.94		
95% Adjusted Gamma UCL	29.22		

Potential UCL to Use		
	Use 95% Student's-t UCL	28.7
	or 95% Modified-t UCL	28.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options			
From File	217-01.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	15.8	Minimum of Log Data	2.76
Maximum	88.9	Maximum of Log Data	4.488
Mean	75.16	Mean of log Data	4.246
Median	85	SD of log Data	0.479
SD	21.42		
Coefficient of Variation	0.285		
Skewness	-2.184		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.594	Shapiro Wilk Test Statistic	0.514
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	85.75	95% H-UCL	104.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	123.6
95% Adjusted-CLT UCL (Chen-1995)	81.09	97.5% Chebyshev (MVUE) UCL	143.5
95% Modified-t UCL (Johnson-1978)	85.15	99% Chebyshev (MVUE) UCL	182.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.401	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.92		
MLE of Mean	75.16		
MLE of Standard Deviation	32.34		
nu star	140.4		
Approximate Chi Square Value (.05)	114	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	84.93
Adjusted Chi Square Value	110.7	95% Jackknife UCL	85.75
		95% Standard Bootstrap UCL	84.37
Anderson-Darling Test Statistic	2.726	95% Bootstrap-t UCL	82.77
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	81.98
Kolmogorov-Smirnov Test Statistic	0.445	95% Percentile Bootstrap UCL	83.16
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	82.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.1
		97.5% Chebyshev(Mean, Sd) UCL	112.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.3
95% Approximate Gamma UCL	92.55		
95% Adjusted Gamma UCL	95.38		

Potential UCL to Use		
	Use 95% Student's-t UCL	85.75
	or 95% Modified-t UCL	85.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11.4	Minimum of Log Data	2.434
Maximum	25	Maximum of Log Data	3.219
Mean	18.2	Mean of log Data	2.89
Median	18.2	SD of log Data	0.163
SD	2.776		
Coefficient of Variation	0.153		
Skewness	5.76E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.557
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.57	95% H-UCL	19.84
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.81
95% Adjusted-CLT UCL (Chen-1995)	19.47	97.5% Chebyshev (MVUE) UCL	23.36
95% Modified-t UCL (Johnson-1978)	19.57	99% Chebyshev (MVUE) UCL	26.42

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	33.43	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.544		
MLE of Mean	18.2		
MLE of Standard Deviation	3.148		
nu star	869.3		
Approximate Chi Square Value (.05)	801.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	19.47
Adjusted Chi Square Value	792.6	95% Jackknife UCL	19.57
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.096	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.443	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21.56
		97.5% Chebyshev(Mean, Sd) UCL	23.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.86
95% Approximate Gamma UCL	19.73		
95% Adjusted Gamma UCL	19.96		

Potential UCL to Use		
	Use 95% Student's-t UCL	19.57
	or 95% Modified-t UCL	19.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	90.73	Minimum of Log Data	4.508
Maximum	1956	Maximum of Log Data	7.579
Mean	476.4	Mean of log Data	5.785
Median	278.1	SD of log Data	0.86
SD	514.9		
Coefficient of Variation	1.081		
Skewness	2.333		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.706	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	730.9	95% H-UCL	900.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	955.9
95% Adjusted-CLT UCL (Chen-1995)	810	97.5% Chebyshev (MVUE) UCL	1173
95% Modified-t UCL (Johnson-1978)	746.3	99% Chebyshev (MVUE) UCL	1600

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.171	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	406.8		
MLE of Mean	476.4		
MLE of Standard Deviation	440.2		
nu star	30.45		
Approximate Chi Square Value (.05)	18.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	711.3
Adjusted Chi Square Value	17.55	95% Jackknife UCL	730.9
		95% Standard Bootstrap UCL	693.8
Anderson-Darling Test Statistic	0.535	95% Bootstrap-t UCL	1133
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	1768
Kolmogorov-Smirnov Test Statistic	0.17	95% Percentile Bootstrap UCL	721.3
Kolmogorov-Smirnov 5% Critical Value	0.241	95% BCA Bootstrap UCL	826.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1099
		97.5% Chebyshev(Mean, Sd) UCL	1368
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1897
95% Approximate Gamma UCL	769.7		
95% Adjusted Gamma UCL	826.3		

Potential UCL to Use	Use 95% Approximate Gamma UCL	769.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	11.4	Minimum of Log Data	2.434
Maximum	130.4	Maximum of Log Data	4.871
Mean	69.19	Mean of log Data	4.09
Median	65	SD of log Data	0.645
SD	32.85		
Coefficient of Variation	0.475		
Skewness	0.333		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.881	Shapiro Wilk Test Statistic	0.792
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	85.42	95% H-UCL	112.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	130.7
95% Adjusted-CLT UCL (Chen-1995)	85.07	97.5% Chebyshev (MVUE) UCL	156.1
95% Modified-t UCL (Johnson-1978)	85.56	99% Chebyshev (MVUE) UCL	205.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.786	Data appear Normal at 5% Significance Level	
Theta Star	24.84		
MLE of Mean	69.19		
MLE of Standard Deviation	41.45		
nu star	72.43		
Approximate Chi Square Value (.05)	53.83	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	84.17
Adjusted Chi Square Value	51.56	95% Jackknife UCL	85.42
		95% Standard Bootstrap UCL	83.85
Anderson-Darling Test Statistic	1.034	95% Bootstrap-t UCL	88.37
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	92.75
Kolmogorov-Smirnov Test Statistic	0.297	95% Percentile Bootstrap UCL	83.61
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	84.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	108.9
		97.5% Chebyshev(Mean, Sd) UCL	126.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	159.8
95% Approximate Gamma UCL	93.09		
95% Adjusted Gamma UCL	97.2		

Potential UCL to Use	Use 95% Student's-t UCL	85.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.016	Minimum of Log Data	-4.135
Maximum	13.45	Maximum of Log Data	2.599
Mean	8.835	Mean of log Data	1.382
Median	10	SD of log Data	2.345
SD	4.034		
Coefficient of Variation	0.457		
Skewness	-1.862		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.616	Shapiro Wilk Test Statistic	0.481
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.83	95% H-UCL	2661
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	147
95% Adjusted-CLT UCL (Chen-1995)	10.06	97.5% Chebyshev (MVUE) UCL	194.9
95% Modified-t UCL (Johnson-1978)	10.73	99% Chebyshev (MVUE) UCL	289.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.629	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.04		
MLE of Mean	8.835		
MLE of Standard Deviation	11.14		
nu star	16.36		
Approximate Chi Square Value (.05)	8.217	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.68
Adjusted Chi Square Value	7.408	95% Jackknife UCL	10.83
		95% Standard Bootstrap UCL	10.64
Anderson-Darling Test Statistic	3.786	95% Bootstrap-t UCL	10.32
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	10.16
Kolmogorov-Smirnov Test Statistic	0.536	95% Percentile Bootstrap UCL	10.47
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	10.31
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.71
		97.5% Chebyshev(Mean, Sd) UCL	15.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.97
95% Approximate Gamma UCL	17.59		
95% Adjusted Gamma UCL	19.51		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	19.97
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.98	Minimum of Log Data	-0.0202
Maximum	1.27	Maximum of Log Data	0.239
Mean	1.125	Mean of log Data	0.116
Median	1.125	SD of log Data	0.053
SD	0.0592		
Coefficient of Variation	0.0526		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.572
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.154	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.197
95% Adjusted-CLT UCL (Chen-1995)	1.152	97.5% Chebyshev (MVUE) UCL	1.228
95% Modified-t UCL (Johnson-1978)	1.154	99% Chebyshev (MVUE) UCL	1.29

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	298.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00377		
MLE of Mean	1.125		
MLE of Standard Deviation	0.0651		
nu star	7765		
Approximate Chi Square Value (.05)	7561	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	1.152
Adjusted Chi Square Value	7532	95% Jackknife UCL	1.154
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.076	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.197
		97.5% Chebyshev(Mean, Sd) UCL	1.228
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.288
95% Approximate Gamma UCL	1.155		
95% Adjusted Gamma UCL	1.16		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.154
	or 95% Modified-t UCL	1.154

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options			
From File	217-02.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Antimony

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.44	Minimum of Log Data	-0.821
Maximum	20	Maximum of Log Data	2.996
Mean	4.794	Mean of log Data	1.255
Median	4.794	SD of log Data	0.891
SD	4.256		
Coefficient of Variation	0.888		
Skewness	3.019		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.547	Shapiro Wilk Test Statistic	0.745
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.596	95% H-UCL	9.102
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.23
95% Adjusted-CLT UCL (Chen-1995)	7.3	97.5% Chebyshev (MVUE) UCL	12.47
95% Modified-t UCL (Johnson-1978)	6.722	99% Chebyshev (MVUE) UCL	16.88

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.478	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.245		
MLE of Mean	4.794		
MLE of Standard Deviation	3.944		
nu star	50.24		
Approximate Chi Square Value (.05)	34.96	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	6.492
Adjusted Chi Square Value	33.63	95% Jackknife UCL	6.596
		95% Standard Bootstrap UCL	6.423
Anderson-Darling Test Statistic	2.374	95% Bootstrap-t UCL	7.821
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	14.02
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	6.596
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	7.411
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.294
		97.5% Chebyshev(Mean, Sd) UCL	11.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.07
95% Approximate Gamma UCL	6.888		
95% Adjusted Gamma UCL	7.162		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	9.294

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	3.8	Minimum of Log Data	1.335
Maximum	21.3	Maximum of Log Data	3.059
Mean	9.32	Mean of log Data	2.154
Median	9.32	SD of log Data	0.408
SD	3.998		
Coefficient of Variation	0.429		
Skewness	1.545		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.841	Shapiro Wilk Test Statistic	0.94
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.01	95% H-UCL	11.42
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.42
95% Adjusted-CLT UCL (Chen-1995)	11.3	97.5% Chebyshev (MVUE) UCL	15.2
95% Modified-t UCL (Johnson-1978)	11.07	99% Chebyshev (MVUE) UCL	18.69
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.41	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.723		
MLE of Mean	9.32		
MLE of Standard Deviation	4.007		
nu star	183.9		
Approximate Chi Square Value (.05)	153.6	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	10.91
Adjusted Chi Square Value	150.7	95% Jackknife UCL	11.01
		95% Standard Bootstrap UCL	10.82
Anderson-Darling Test Statistic	0.591	95% Bootstrap-t UCL	11.62
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	12.84
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	10.94
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	11.15
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.55
		97.5% Chebyshev(Mean, Sd) UCL	15.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.97
95% Approximate Gamma UCL	11.16		
95% Adjusted Gamma UCL	11.38		
Potential UCL to Use		Use 95% Approximate Gamma UCL	11.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	7.9	Minimum of Log Data	2.067
Maximum	108.2	Maximum of Log Data	4.684
Mean	70.4	Mean of log Data	4.081
Median	85	SD of log Data	0.743
SD	29.52		
Coefficient of Variation	0.419		
Skewness	-1.26		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.716	Shapiro Wilk Test Statistic	0.643
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	82.9	95% H-UCL	119.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	140.4
95% Adjusted-CLT UCL (Chen-1995)	79.83	97.5% Chebyshev (MVUE) UCL	168.1
95% Modified-t UCL (Johnson-1978)	82.53	99% Chebyshev (MVUE) UCL	222.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.538	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.73		
MLE of Mean	70.4		
MLE of Standard Deviation	44.19		
nu star	86.31		
Approximate Chi Square Value (.05)	65.89	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	82.18
Adjusted Chi Square Value	64.02	95% Jackknife UCL	82.9
		95% Standard Bootstrap UCL	81.85
Anderson-Darling Test Statistic	2.87	95% Bootstrap-t UCL	81.44
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	79.38
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	81.05
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	79.85
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.6
		97.5% Chebyshev(Mean, Sd) UCL	115.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	141.6
95% Approximate Gamma UCL	92.21		
95% Adjusted Gamma UCL	94.91		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	101.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	6.7	Minimum of Log Data	1.902
Maximum	27	Maximum of Log Data	3.296
Mean	15.6	Mean of log Data	2.706
Median	15.6	SD of log Data	0.314
SD	4.262		
Coefficient of Variation	0.273		
Skewness	0.266		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.712	Shapiro Wilk Test Statistic	0.671
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.4	95% H-UCL	18.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.96
95% Adjusted-CLT UCL (Chen-1995)	17.37	97.5% Chebyshev (MVUE) UCL	23.24
95% Modified-t UCL (Johnson-1978)	17.42	99% Chebyshev (MVUE) UCL	27.73

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.19	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.531		
MLE of Mean	15.6		
MLE of Standard Deviation	4.887		
nu star	346.4		
Approximate Chi Square Value (.05)	304.3	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	17.3
Adjusted Chi Square Value	300.1	95% Jackknife UCL	17.4
		95% Standard Bootstrap UCL	17.25
Anderson-Darling Test Statistic	2.826	95% Bootstrap-t UCL	17.36
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	17.85
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	17.31
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	17.38
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.11
		97.5% Chebyshev(Mean, Sd) UCL	22.06
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.89
95% Approximate Gamma UCL	17.76		
95% Adjusted Gamma UCL	18		

Potential UCL to Use		
	Use 95% Student's-t UCL	17.4
	or 95% Modified-t UCL	17.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	11304	Minimum of Log Data	9.333
Maximum	60384	Maximum of Log Data	11.01
Mean	25124	Mean of log Data	10.03
Median	20598	SD of log Data	0.458
SD	12694		
Coefficient of Variation	0.505		
Skewness	1.445		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.864	Shapiro Wilk Test Statistic	0.961
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30499	95% H-UCL	31597
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	37411
95% Adjusted-CLT UCL (Chen-1995)	31341	97.5% Chebyshev (MVUE) UCL	42789
95% Modified-t UCL (Johnson-1978)	30678	99% Chebyshev (MVUE) UCL	53353

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.142	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	6066		
MLE of Mean	25124		
MLE of Standard Deviation	12345		
nu star	140.8		
Approximate Chi Square Value (.05)	114.4	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	30188
Adjusted Chi Square Value	111.9	95% Jackknife UCL	30499
		95% Standard Bootstrap UCL	30004
Anderson-Darling Test Statistic	0.427	95% Bootstrap-t UCL	32380
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	33410
Kolmogorov-Smirnov Test Statistic	0.172	95% Percentile Bootstrap UCL	30338
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	31096
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38543
		97.5% Chebyshev(Mean, Sd) UCL	44350
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	55756
95% Approximate Gamma UCL	30926		
95% Adjusted Gamma UCL	31616		

Potential UCL to Use		Use 95% Approximate Gamma UCL	30926

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	205.7	Minimum of Log Data	5.326
Maximum	2054	Maximum of Log Data	7.628
Mean	637	Mean of log Data	6.269
Median	544.1	SD of log Data	0.609
SD	458		
Coefficient of Variation	0.719		
Skewness	2.075		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.791	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	830.9	95% H-UCL	881.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1050
95% Adjusted-CLT UCL (Chen-1995)	879.4	97.5% Chebyshev (MVUE) UCL	1233
95% Modified-t UCL (Johnson-1978)	840.3	99% Chebyshev (MVUE) UCL	1592
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.359	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	270		
MLE of Mean	637		
MLE of Standard Deviation	414.7		
nu star	80.22		
Approximate Chi Square Value (.05)	60.58	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	819.7
Adjusted Chi Square Value	58.8	95% Jackknife UCL	830.9
		95% Standard Bootstrap UCL	813.9
Anderson-Darling Test Statistic	0.374	95% Bootstrap-t UCL	958.8
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1707
Kolmogorov-Smirnov Test Statistic	0.137	95% Percentile Bootstrap UCL	821.5
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	884.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1121
		97.5% Chebyshev(Mean, Sd) UCL	1331
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1742
95% Approximate Gamma UCL	843.5		
95% Adjusted Gamma UCL	869.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	843.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.007	Minimum of Log Data	-5.006
Maximum	10	Maximum of Log Data	2.303
Mean	6.811	Mean of log Data	0.698
Median	10	SD of log Data	2.571
SD	4.553		
Coefficient of Variation	0.668		
Skewness	-0.9		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.649	Shapiro Wilk Test Statistic	0.661
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.739	95% H-UCL	1830
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	126.6
95% Adjusted-CLT UCL (Chen-1995)	8.37	97.5% Chebyshev (MVUE) UCL	168.1
95% Modified-t UCL (Johnson-1978)	8.699	99% Chebyshev (MVUE) UCL	249.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.465	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.63		
MLE of Mean	6.811		
MLE of Standard Deviation	9.983		
nu star	15.82		
Approximate Chi Square Value (.05)	7.839	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	8.627
Adjusted Chi Square Value	7.255	95% Jackknife UCL	8.739
		95% Standard Bootstrap UCL	8.588
Anderson-Darling Test Statistic	3.294	95% Bootstrap-t UCL	8.452
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	8.354
Kolmogorov-Smirnov Test Statistic	0.386	95% Percentile Bootstrap UCL	8.557
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	8.275
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.62
		97.5% Chebyshev(Mean, Sd) UCL	13.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.8
95% Approximate Gamma UCL	13.75		
95% Adjusted Gamma UCL	14.86		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.8
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	13.8	Minimum of Log Data	2.625
Maximum	131.5	Maximum of Log Data	4.879
Mean	69.24	Mean of log Data	4.144
Median	65	SD of log Data	0.504
SD	26.63		
Coefficient of Variation	0.385		
Skewness	0.337		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk Test Statistic	0.728
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	80.51	95% H-UCL	92.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.1
95% Adjusted-CLT UCL (Chen-1995)	80.42	97.5% Chebyshev (MVUE) UCL	127
95% Modified-t UCL (Johnson-1978)	80.6	99% Chebyshev (MVUE) UCL	160.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.552	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.21		
MLE of Mean	69.24		
MLE of Standard Deviation	32.45		
nu star	154.8		
Approximate Chi Square Value (.05)	127	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	79.86
Adjusted Chi Square Value	124.4	95% Jackknife UCL	80.51
		95% Standard Bootstrap UCL	79.28
Anderson-Darling Test Statistic	1.89	95% Bootstrap-t UCL	81.75
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	86.04
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	79.59
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	79.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	97.39
		97.5% Chebyshev(Mean, Sd) UCL	109.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	133.5
95% Approximate Gamma UCL	84.37		
95% Adjusted Gamma UCL	86.16		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	97.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	16.09	Maximum of Log Data	2.778
Mean	8.683	Mean of log Data	1.567
Median	10	SD of log Data	1.738
SD	4.796		
Coefficient of Variation	0.552		
Skewness	-0.74		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Test Statistic	0.622
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.71	95% H-UCL	118.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	57.29
95% Adjusted-CLT UCL (Chen-1995)	10.37	97.5% Chebyshev (MVUE) UCL	74.27
95% Modified-t UCL (Johnson-1978)	10.68	99% Chebyshev (MVUE) UCL	107.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.841	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.32		
MLE of Mean	8.683		
MLE of Standard Deviation	9.465		
nu star	28.61		
Approximate Chi Square Value (.05)	17.4	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	10.6
Adjusted Chi Square Value	16.49	95% Jackknife UCL	10.71
		95% Standard Bootstrap UCL	10.53
Anderson-Darling Test Statistic	2.785	95% Bootstrap-t UCL	10.46
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	10.41
Kolmogorov-Smirnov Test Statistic	0.399	95% Percentile Bootstrap UCL	10.54
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	10.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.75
		97.5% Chebyshev(Mean, Sd) UCL	15.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.26
95% Approximate Gamma UCL	14.27		
95% Adjusted Gamma UCL	15.06		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	20.26
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.01	Minimum of Log Data	-4.636
Maximum	0.737	Maximum of Log Data	-0.306
Mean	0.369	Mean of log Data	-1.172
Median	0.369	SD of log Data	0.908
SD	0.129		
Coefficient of Variation	0.349		
Skewness	0.117		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.353
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.423	95% H-UCL	0.832
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.927
95% Adjusted-CLT UCL (Chen-1995)	0.421	97.5% Chebyshev (MVUE) UCL	1.133
95% Modified-t UCL (Johnson-1978)	0.423	99% Chebyshev (MVUE) UCL	1.536

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.525	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.146		
MLE of Mean	0.369		
MLE of Standard Deviation	0.232		
nu star	85.84		
Approximate Chi Square Value (.05)	65.48	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	0.42
Adjusted Chi Square Value	63.62	95% Jackknife UCL	0.423
		95% Standard Bootstrap UCL	0.419
Anderson-Darling Test Statistic	4.934	95% Bootstrap-t UCL	0.416
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.439
Kolmogorov-Smirnov Test Statistic	0.501	95% Percentile Bootstrap UCL	0.413
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	0.432
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.505
		97.5% Chebyshev(Mean, Sd) UCL	0.564
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.679
95% Approximate Gamma UCL	0.483		
95% Adjusted Gamma UCL	0.498		

Potential UCL to Use		
	Use 95% Chebyshev (Mean, Sd) UCL	0.505

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options
From File 221-01.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Aluminum

General Statistics
Number of Valid Observations 17 Number of Distinct Observations 5

Raw Statistics		Log-transformed Statistics	
Minimum	4170	Minimum of Log Data	8.336
Maximum	52800	Maximum of Log Data	10.87
Mean	19493	Mean of log Data	9.773
Median	19493	SD of log Data	0.497
SD	9702		
Coefficient of Variation	0.498		
Skewness	2.475		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.666
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	23601	95% H-UCL	25558
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30385
95% Adjusted-CLT UCL (Chen-1995)	24872	97.5% Chebyshev (MVUE) UCL	35008
95% Modified-t UCL (Johnson-1978)	23836	99% Chebyshev (MVUE) UCL	44090

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.097	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4757		
MLE of Mean	19493		
MLE of Standard Deviation	9630		
nu star	139.3		
Approximate Chi Square Value (.05)	113	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	23363
Adjusted Chi Square Value	110.6	95% Jackknife UCL	23601
		95% Standard Bootstrap UCL	23305
Anderson-Darling Test Statistic	2.968	95% Bootstrap-t UCL	25316
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	42994
Kolmogorov-Smirnov Test Statistic	0.383	95% Percentile Bootstrap UCL	23556
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	24469
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29749
		97.5% Chebyshev(Mean, Sd) UCL	34187
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42904
95% Approximate Gamma UCL	24023		
95% Adjusted Gamma UCL	24562		

Potential UCL to Use		
	Use 95% Student's-t UCL	23601
	or 95% Modified-t UCL	23836

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.25	Minimum of Log Data	-1.386
Maximum	1.1	Maximum of Log Data	0.0953
Mean	0.505	Mean of log Data	-0.728
Median	0.505	SD of log Data	0.299
SD	0.173		
Coefficient of Variation	0.343		
Skewness	2.5		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.572	Shapiro Wilk Test Statistic	0.677
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.578	95% H-UCL	0.581
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.665
95% Adjusted-CLT UCL (Chen-1995)	0.601	97.5% Chebyshev (MVUE) UCL	0.735
95% Modified-t UCL (Johnson-1978)	0.583	99% Chebyshev (MVUE) UCL	0.872

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.428	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0536		
MLE of Mean	0.505		
MLE of Standard Deviation	0.164		
nu star	320.6		
Approximate Chi Square Value (.05)	280.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.574
Adjusted Chi Square Value	276.1	95% Jackknife UCL	0.578
		95% Standard Bootstrap UCL	0.572
Anderson-Darling Test Statistic	2.992	95% Bootstrap-t UCL	0.61
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	0.921
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	0.575
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.61
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.688
		97.5% Chebyshev(Mean, Sd) UCL	0.767
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.923
95% Approximate Gamma UCL	0.578		
95% Adjusted Gamma UCL	0.586		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.578
		or 95% Modified-t UCL	0.583

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	2.6	Minimum of Log Data	0.956
Maximum	28.4	Maximum of Log Data	3.346
Mean	10.06	Mean of log Data	2.198
Median	10.06	SD of log Data	0.484
SD	5.457		
Coefficient of Variation	0.543		
Skewness	2.456		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.734	Shapiro Wilk Test Statistic	0.891
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.37	95% H-UCL	12.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.36
95% Adjusted-CLT UCL (Chen-1995)	13.08	97.5% Chebyshev (MVUE) UCL	17.65
95% Modified-t UCL (Johnson-1978)	12.5	99% Chebyshev (MVUE) UCL	22.17

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.893	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.584		
MLE of Mean	10.06		
MLE of Standard Deviation	5.098		
nu star	132.4		
Approximate Chi Square Value (.05)	106.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	12.24
Adjusted Chi Square Value	104.4	95% Jackknife UCL	12.37
		95% Standard Bootstrap UCL	12.16
Anderson-Darling Test Statistic	0.869	95% Bootstrap-t UCL	13.86
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	23.13
Kolmogorov-Smirnov Test Statistic	0.245	95% Percentile Bootstrap UCL	12.28
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	12.89
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.83
		97.5% Chebyshev(Mean, Sd) UCL	18.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.23
95% Approximate Gamma UCL	12.47		
95% Adjusted Gamma UCL	12.75		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.37
	or 95% Modified-t UCL	12.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	121	Minimum of Log Data	4.796
Maximum	1630	Maximum of Log Data	7.396
Mean	527	Mean of log Data	6.116
Median	527	SD of log Data	0.594
SD	319		
Coefficient of Variation	0.605		
Skewness	2.59		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.678
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	662.1	95% H-UCL	742.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	884.7
95% Adjusted-CLT UCL (Chen-1995)	706.2	97.5% Chebyshev (MVUE) UCL	1036
95% Modified-t UCL (Johnson-1978)	670.2	99% Chebyshev (MVUE) UCL	1334

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.897	Data do not follow a Discernable Distribution (0.05)	
Theta Star	181.9		
MLE of Mean	527		
MLE of Standard Deviation	309.6		
nu star	98.51		
Approximate Chi Square Value (.05)	76.61	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	654.3
Adjusted Chi Square Value	74.59	95% Jackknife UCL	662.1
		95% Standard Bootstrap UCL	653.2
Anderson-Darling Test Statistic	2.983	95% Bootstrap-t UCL	725.3
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	1275
Kolmogorov-Smirnov Test Statistic	0.395	95% Percentile Bootstrap UCL	656.8
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	714.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	864.2
		97.5% Chebyshev(Mean, Sd) UCL	1010
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1297
95% Approximate Gamma UCL	677.6		
95% Adjusted Gamma UCL	696		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	864.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.17	Minimum of Log Data	-1.772
Maximum	2.7	Maximum of Log Data	0.993
Mean	1.028	Mean of log Data	-0.0885
Median	1.028	SD of log Data	0.55
SD	0.497		
Coefficient of Variation	0.484		
Skewness	2.195		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.576	Shapiro Wilk Test Statistic	0.618
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.238	95% H-UCL	1.418
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.69
95% Adjusted-CLT UCL (Chen-1995)	1.294	97.5% Chebyshev (MVUE) UCL	1.966
95% Modified-t UCL (Johnson-1978)	1.249	99% Chebyshev (MVUE) UCL	2.507

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.733	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.275		
MLE of Mean	1.028		
MLE of Standard Deviation	0.532		
nu star	126.9		
Approximate Chi Square Value (.05)	101.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	1.226
Adjusted Chi Square Value	99.55	95% Jackknife UCL	1.238
		95% Standard Bootstrap UCL	1.22
Anderson-Darling Test Statistic	3.244	95% Bootstrap-t UCL	1.292
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	2.305
Kolmogorov-Smirnov Test Statistic	0.386	95% Percentile Bootstrap UCL	1.236
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	1.323
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.553
		97.5% Chebyshev(Mean, Sd) UCL	1.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.227
95% Approximate Gamma UCL	1.28		
95% Adjusted Gamma UCL	1.31		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.553

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	18.9	Minimum of Log Data	2.939
Maximum	85	Maximum of Log Data	4.443
Mean	58.37	Mean of log Data	4.013
Median	59.44	SD of log Data	0.367
SD	17.24		
Coefficient of Variation	0.295		
Skewness	-0.517		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.968	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.67	95% H-UCL	70.53
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	82.21
95% Adjusted-CLT UCL (Chen-1995)	64.69	97.5% Chebyshev (MVUE) UCL	92.28
95% Modified-t UCL (Johnson-1978)	65.59	99% Chebyshev (MVUE) UCL	112.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.856	Data appear Normal at 5% Significance Level	
Theta Star	7.43		
MLE of Mean	58.37		
MLE of Standard Deviation	20.83		
nu star	267.1		
Approximate Chi Square Value (.05)	230.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	65.25
Adjusted Chi Square Value	226.7	95% Jackknife UCL	65.67
		95% Standard Bootstrap UCL	65.06
Anderson-Darling Test Statistic	0.486	95% Bootstrap-t UCL	65.1
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	64.72
Kolmogorov-Smirnov Test Statistic	0.19	95% Percentile Bootstrap UCL	64.54
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	64.47
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.6
		97.5% Chebyshev(Mean, Sd) UCL	84.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	99.99
95% Approximate Gamma UCL	67.71		
95% Adjusted Gamma UCL	68.78		

Potential UCL to Use		Use 95% Student's-t UCL	65.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	2.2	Minimum of Log Data	0.788
Maximum	144	Maximum of Log Data	4.97
Mean	40.53	Mean of log Data	3.405
Median	40.53	SD of log Data	0.957
SD	29.91		
Coefficient of Variation	0.738		
Skewness	2.596		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.561	Shapiro Wilk Test Statistic	0.653
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	53.19	95% H-UCL	88.85
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.88
95% Adjusted-CLT UCL (Chen-1995)	57.34	97.5% Chebyshev (MVUE) UCL	118.9
95% Modified-t UCL (Johnson-1978)	53.95	99% Chebyshev (MVUE) UCL	162.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.551	Data do not follow a Discernable Distribution (0.05)	
Theta Star	26.13		
MLE of Mean	40.53		
MLE of Standard Deviation	32.54		
nu star	52.72		
Approximate Chi Square Value (.05)	37.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	52.46
Adjusted Chi Square Value	35.67	95% Jackknife UCL	53.19
		95% Standard Bootstrap UCL	52.55
Anderson-Darling Test Statistic	3.027	95% Bootstrap-t UCL	59.15
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	110.5
Kolmogorov-Smirnov Test Statistic	0.422	95% Percentile Bootstrap UCL	52.7
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	59.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.15
		97.5% Chebyshev(Mean, Sd) UCL	85.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	112.7
95% Approximate Gamma UCL	57.68		
95% Adjusted Gamma UCL	59.9		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	72.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	7202	Minimum of Log Data	8.882
Maximum	79900	Maximum of Log Data	11.29
Mean	20319	Mean of log Data	9.735
Median	14694	SD of log Data	0.546
SD	17279		
Coefficient of Variation	0.85		
Skewness	3.001		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.566	Shapiro Wilk Test Statistic	0.789
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27635	95% H-UCL	26048
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31052
95% Adjusted-CLT UCL (Chen-1995)	30471	97.5% Chebyshev (MVUE) UCL	36085
95% Modified-t UCL (Johnson-1978)	28144	99% Chebyshev (MVUE) UCL	45973

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8461		
MLE of Mean	20319		
MLE of Standard Deviation	13111		
nu star	81.65		
Approximate Chi Square Value (.05)	61.83	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	27212
Adjusted Chi Square Value	60.02	95% Jackknife UCL	27635
		95% Standard Bootstrap UCL	26953
Anderson-Darling Test Statistic	2.111	95% Bootstrap-t UCL	46521
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	57290
Kolmogorov-Smirnov Test Statistic	0.324	95% Percentile Bootstrap UCL	27536
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	31428
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38586
		97.5% Chebyshev(Mean, Sd) UCL	46490
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	62016
95% Approximate Gamma UCL	26833		
95% Adjusted Gamma UCL	27640		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	38586

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	17
Raw Statistics		Log-transformed Statistics	
Minimum	150	Minimum of Log Data	5.011
Maximum	13100	Maximum of Log Data	9.48
Mean	1108	Mean of log Data	5.938
Median	325.6	SD of log Data	1.06
SD	3100		
Coefficient of Variation	2.799		
Skewness	4.082		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.319	Shapiro Wilk Test Statistic	0.727
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2420	95% H-UCL	1382
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1425
95% Adjusted-CLT UCL (Chen-1995)	3139	97.5% Chebyshev (MVUE) UCL	1767
95% Modified-t UCL (Johnson-1978)	2544	99% Chebyshev (MVUE) UCL	2440
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.516	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2145		
MLE of Mean	1108		
MLE of Standard Deviation	1541		
nu star	17.56		
Approximate Chi Square Value (.05)	9.071	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	2344
Adjusted Chi Square Value	8.437	95% Jackknife UCL	2420
		95% Standard Bootstrap UCL	2313
Anderson-Darling Test Statistic	3.253	95% Bootstrap-t UCL	18826
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	9631
Kolmogorov-Smirnov Test Statistic	0.376	95% Percentile Bootstrap UCL	2580
Kolmogorov-Smirnov 5% Critical Value	0.22	95% BCA Bootstrap UCL	3375
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4385
		97.5% Chebyshev(Mean, Sd) UCL	5803
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8588
95% Approximate Gamma UCL	2144		
95% Adjusted Gamma UCL	2305		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	4385

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0121	Minimum of Log Data	-4.415
Maximum	12.29	Maximum of Log Data	2.509
Mean	8.617	Mean of log Data	1.583
Median	10	SD of log Data	1.969
SD	3.398		
Coefficient of Variation	0.394		
Skewness	-2.147		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.611	Shapiro Wilk Test Statistic	0.442
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.06	95% H-UCL	285.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.16
95% Adjusted-CLT UCL (Chen-1995)	9.514	97.5% Chebyshev (MVUE) UCL	117.9
95% Modified-t UCL (Johnson-1978)	9.985	99% Chebyshev (MVUE) UCL	172.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.871	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.89		
MLE of Mean	8.617		
MLE of Standard Deviation	9.232		
nu star	29.62		
Approximate Chi Square Value (.05)	18.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	9.973
Adjusted Chi Square Value	17.26	95% Jackknife UCL	10.06
		95% Standard Bootstrap UCL	9.942
Anderson-Darling Test Statistic	4.785	95% Bootstrap-t UCL	9.665
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	9.551
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	9.811
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	9.653
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.21
		97.5% Chebyshev(Mean, Sd) UCL	13.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.82
95% Approximate Gamma UCL	14.03		
95% Adjusted Gamma UCL	14.79		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	16.82
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	7.7	Minimum of Log Data	2.041
Maximum	139	Maximum of Log Data	4.934
Mean	65.56	Mean of log Data	4.038
Median	65	SD of log Data	0.678
SD	27.45		
Coefficient of Variation	0.419		
Skewness	0.246		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.735	Shapiro Wilk Test Statistic	0.608
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	77.19	95% H-UCL	104.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	123.5
95% Adjusted-CLT UCL (Chen-1995)	76.94	97.5% Chebyshev (MVUE) UCL	146.5
95% Modified-t UCL (Johnson-1978)	77.25	99% Chebyshev (MVUE) UCL	191.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.008	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.8		
MLE of Mean	65.56		
MLE of Standard Deviation	37.8		
nu star	102.3		
Approximate Chi Square Value (.05)	79.93	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	76.52
Adjusted Chi Square Value	77.86	95% Jackknife UCL	77.19
		95% Standard Bootstrap UCL	76.2
Anderson-Darling Test Statistic	2.927	95% Bootstrap-t UCL	76.94
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	80.09
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	76.38
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	77.41
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.59
		97.5% Chebyshev(Mean, Sd) UCL	107.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	131.8
95% Approximate Gamma UCL	83.88		
95% Adjusted Gamma UCL	86.11		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	94.59

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	5	Maximum of Log Data	1.609
Mean	4.082	Mean of log Data	1.229
Median	4.082	SD of log Data	0.817
SD	1.452		
Coefficient of Variation	0.356		
Skewness	-2.153		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.697	95% H-UCL	7.758
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.985
95% Adjusted-CLT UCL (Chen-1995)	4.465	97.5% Chebyshev (MVUE) UCL	10.86
95% Modified-t UCL (Johnson-1978)	4.666	99% Chebyshev (MVUE) UCL	14.54

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.483	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.644		
MLE of Mean	4.082		
MLE of Standard Deviation	2.59		
nu star	84.44		
Approximate Chi Square Value (.05)	64.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	4.661
Adjusted Chi Square Value	62.41	95% Jackknife UCL	4.697
		95% Standard Bootstrap UCL	4.64
Anderson-Darling Test Statistic	3.763	95% Bootstrap-t UCL	4.532
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	4.512
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	4.568
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	4.514
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.617
		97.5% Chebyshev(Mean, Sd) UCL	6.281
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.586
95% Approximate Gamma UCL	5.364		
95% Adjusted Gamma UCL	5.522		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.617

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.023	Minimum of Log Data	-3.772
Maximum	10	Maximum of Log Data	2.303
Mean	7.497	Mean of log Data	0.999
Median	10	SD of log Data	2.396
SD	4.299		
Coefficient of Variation	0.573		
Skewness	-1.308		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.572
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.317	95% H-UCL	1037
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	118.6
95% Adjusted-CLT UCL (Chen-1995)	8.858	97.5% Chebyshev (MVUE) UCL	157.1
95% Modified-t UCL (Johnson-1978)	9.262	99% Chebyshev (MVUE) UCL	232.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.539	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.9		
MLE of Mean	7.497		
MLE of Standard Deviation	10.21		
nu star	18.34		
Approximate Chi Square Value (.05)	9.639	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	9.212
Adjusted Chi Square Value	8.983	95% Jackknife UCL	9.317
		95% Standard Bootstrap UCL	9.147
Anderson-Darling Test Statistic	4.178	95% Bootstrap-t UCL	9.005
Anderson-Darling 5% Critical Value	0.789	95% Hall's Bootstrap UCL	8.85
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	9.104
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	8.798
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.04
		97.5% Chebyshev(Mean, Sd) UCL	14.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.87
95% Approximate Gamma UCL	14.27		
95% Adjusted Gamma UCL	15.31		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.87
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.13	Minimum of Log Data	-2.04
Maximum	2.4	Maximum of Log Data	0.875
Mean	0.725	Mean of log Data	-0.513
Median	0.725	SD of log Data	0.686
SD	0.484		
Coefficient of Variation	0.667		
Skewness	2.612		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.556	Shapiro Wilk Test Statistic	0.673
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.93	95% H-UCL	1.112
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.316
95% Adjusted-CLT UCL (Chen-1995)	0.997	97.5% Chebyshev (MVUE) UCL	1.563
95% Modified-t UCL (Johnson-1978)	0.942	99% Chebyshev (MVUE) UCL	2.049

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.315	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.313		
MLE of Mean	0.725		
MLE of Standard Deviation	0.477		
nu star	78.69		
Approximate Chi Square Value (.05)	59.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	0.918
Adjusted Chi Square Value	57.49	95% Jackknife UCL	0.93
		95% Standard Bootstrap UCL	0.907
Anderson-Darling Test Statistic	3.034	95% Bootstrap-t UCL	1.027
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1.853
Kolmogorov-Smirnov Test Statistic	0.404	95% Percentile Bootstrap UCL	0.926
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	1.021
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.236
		97.5% Chebyshev(Mean, Sd) UCL	1.458
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.892
95% Approximate Gamma UCL	0.963		
95% Adjusted Gamma UCL	0.992		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.236

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	1.3	Minimum of Log Data	0.262
Maximum	20	Maximum of Log Data	2.996
Mean	12.24	Mean of log Data	2.354
Median	12.24	SD of log Data	0.667
SD	5.625		
Coefficient of Variation	0.46		
Skewness	0.00537		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.802
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.62	95% H-UCL	19.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.57
95% Adjusted-CLT UCL (Chen-1995)	14.49	97.5% Chebyshev (MVUE) UCL	26.74
95% Modified-t UCL (Johnson-1978)	14.62	99% Chebyshev (MVUE) UCL	34.92

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.898	Data appear Normal at 5% Significance Level	
Theta Star	4.224		
MLE of Mean	12.24		
MLE of Standard Deviation	7.191		
nu star	98.53		
Approximate Chi Square Value (.05)	76.63	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	14.49
Adjusted Chi Square Value	74.61	95% Jackknife UCL	14.62
		95% Standard Bootstrap UCL	14.38
Anderson-Darling Test Statistic	0.563	95% Bootstrap-t UCL	14.8
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	14.49
Kolmogorov-Smirnov Test Statistic	0.15	95% Percentile Bootstrap UCL	14.53
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	14.34
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.19
		97.5% Chebyshev(Mean, Sd) UCL	20.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.82
95% Approximate Gamma UCL	15.74		
95% Adjusted Gamma UCL	16.17		

Potential UCL to Use		Use 95% Student's-t UCL	14.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	10.4	Minimum of Log Data	2.342
Maximum	108	Maximum of Log Data	4.682
Mean	45.68	Mean of log Data	3.742
Median	45.68	SD of log Data	0.445
SD	18.65		
Coefficient of Variation	0.408		
Skewness	2.079		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.579	Shapiro Wilk Test Statistic	0.611
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	53.57	95% H-UCL	58.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	68.59
95% Adjusted-CLT UCL (Chen-1995)	55.55	97.5% Chebyshev (MVUE) UCL	78.25
95% Modified-t UCL (Johnson-1978)	53.95	99% Chebyshev (MVUE) UCL	97.23

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.334	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.563		
MLE of Mean	45.68		
MLE of Standard Deviation	19.78		
nu star	181.3		
Approximate Chi Square Value (.05)	151.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	53.12
Adjusted Chi Square Value	148.3	95% Jackknife UCL	53.57
		95% Standard Bootstrap UCL	52.92
Anderson-Darling Test Statistic	3.252	95% Bootstrap-t UCL	55.95
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	95.39
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	53.01
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	55.78
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	65.39
		97.5% Chebyshev(Mean, Sd) UCL	73.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	90.68
95% Approximate Gamma UCL	54.78		
95% Adjusted Gamma UCL	55.85		

Potential UCL to Use		
	Use 95% Student's-t UCL	53.57
	or 95% Modified-t UCL	53.95

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	221-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Barium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Barium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	18.9	Minimum of Log Data	2.939
Maximum	85	Maximum of Log Data	4.443
Mean	62.41	Mean of log Data	4.079
Median	62.26	SD of log Data	0.373
SD	18.22		
Coefficient of Variation	0.292		
Skewness	-0.646		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.822
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.12	95% H-UCL	75.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88.47
95% Adjusted-CLT UCL (Chen-1995)	68.94	97.5% Chebyshev (MVUE) UCL	99.44
95% Modified-t UCL (Johnson-1978)	70.01	99% Chebyshev (MVUE) UCL	121

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.764	Data appear Normal at 5% Significance Level	
Theta Star	8.038		
MLE of Mean	62.41		
MLE of Standard Deviation	22.4		
nu star	264		
Approximate Chi Square Value (.05)	227.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	69.68
Adjusted Chi Square Value	223.8	95% Jackknife UCL	70.12
		95% Standard Bootstrap UCL	69.36
Anderson-Darling Test Statistic	0.617	95% Bootstrap-t UCL	69.74
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	69.24
Kolmogorov-Smirnov Test Statistic	0.179	95% Percentile Bootstrap UCL	69.25
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	68.99
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.67
		97.5% Chebyshev(Mean, Sd) UCL	90.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.4
95% Approximate Gamma UCL	72.46		
95% Adjusted Gamma UCL	73.61		

Potential UCL to Use		Use 95% Student's-t UCL	70.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	7202	Minimum of Log Data	8.882
Maximum	43476	Maximum of Log Data	10.68
Mean	15784	Mean of log Data	9.6
Median	14694	SD of log Data	0.343
SD	7537		
Coefficient of Variation	0.477		
Skewness	3.385		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.556	Shapiro Wilk Test Statistic	0.757
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18976	95% H-UCL	18430
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21365
95% Adjusted-CLT UCL (Chen-1995)	20394	97.5% Chebyshev (MVUE) UCL	23857
95% Modified-t UCL (Johnson-1978)	19226	99% Chebyshev (MVUE) UCL	28752

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.345	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2488		
MLE of Mean	15784		
MLE of Standard Deviation	6266		
nu star	215.7		
Approximate Chi Square Value (.05)	182.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	18791
Adjusted Chi Square Value	179.6	95% Jackknife UCL	18976
		95% Standard Bootstrap UCL	18724
Anderson-Darling Test Statistic	1.97	95% Bootstrap-t UCL	23552
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	33029
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	19262
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	20537
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23752
		97.5% Chebyshev(Mean, Sd) UCL	27200
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	33972
95% Approximate Gamma UCL	18634		
95% Adjusted Gamma UCL	18964		

Potential UCL to Use		
	Use 95% Student's-t UCL	18976
	or 95% Modified-t UCL	19226

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	7.7	Minimum of Log Data	2.041
Maximum	80.29	Maximum of Log Data	4.386
Mean	63.25	Mean of log Data	4.071
Median	65	SD of log Data	0.528
SD	15.14		
Coefficient of Variation	0.239		
Skewness	-3.319		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.464	Shapiro Wilk Test Statistic	0.344
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.66	95% H-UCL	88.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	105.4
95% Adjusted-CLT UCL (Chen-1995)	66.13	97.5% Chebyshev (MVUE) UCL	122.1
95% Modified-t UCL (Johnson-1978)	69.17	99% Chebyshev (MVUE) UCL	154.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.598	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.3		
MLE of Mean	63.25		
MLE of Standard Deviation	26.73		
nu star	190.3		
Approximate Chi Square Value (.05)	159.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	69.29
Adjusted Chi Square Value	156.5	95% Jackknife UCL	69.66
		95% Standard Bootstrap UCL	69.03
Anderson-Darling Test Statistic	4.822	95% Bootstrap-t UCL	67.6
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	67.15
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	67.7
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	67.25
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.26
		97.5% Chebyshev(Mean, Sd) UCL	86.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	99.78
95% Approximate Gamma UCL	75.52		
95% Adjusted Gamma UCL	76.95		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	79.26

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	5	Maximum of Log Data	1.609
Mean	4.082	Mean of log Data	1.229
Median	4.082	SD of log Data	0.817
SD	1.452		
Coefficient of Variation	0.356		
Skewness	-2.153		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.697	95% H-UCL	7.758
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.985
95% Adjusted-CLT UCL (Chen-1995)	4.465	97.5% Chebyshev (MVUE) UCL	10.86
95% Modified-t UCL (Johnson-1978)	4.666	99% Chebyshev (MVUE) UCL	14.54

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.483	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.644		
MLE of Mean	4.082		
MLE of Standard Deviation	2.59		
nu star	84.44		
Approximate Chi Square Value (.05)	64.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	4.661
Adjusted Chi Square Value	62.41	95% Jackknife UCL	4.697
		95% Standard Bootstrap UCL	4.632
Anderson-Darling Test Statistic	3.763	95% Bootstrap-t UCL	4.563
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	4.512
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	4.568
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	4.509
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.617
		97.5% Chebyshev(Mean, Sd) UCL	6.281
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.586
95% Approximate Gamma UCL	5.364		
95% Adjusted Gamma UCL	5.522		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.617

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	5.79	Minimum of Log Data	1.756
Maximum	20	Maximum of Log Data	2.996
Mean	14.15	Mean of log Data	2.576
Median	13.57	SD of log Data	0.412
SD	5.192		
Coefficient of Variation	0.367		
Skewness	-0.131		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.35	95% H-UCL	17.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.58
95% Adjusted-CLT UCL (Chen-1995)	16.18	97.5% Chebyshev (MVUE) UCL	23.32
95% Modified-t UCL (Johnson-1978)	16.35	99% Chebyshev (MVUE) UCL	28.71

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.77	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.453		
MLE of Mean	14.15		
MLE of Standard Deviation	5.892		
nu star	196.2		
Approximate Chi Square Value (.05)	164.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	16.23
Adjusted Chi Square Value	161.8	95% Jackknife UCL	16.35
		95% Standard Bootstrap UCL	16.17
Anderson-Darling Test Statistic	0.791	95% Bootstrap-t UCL	16.3
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	16.03
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	16.11
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	16.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.64
		97.5% Chebyshev(Mean, Sd) UCL	22.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.68
95% Approximate Gamma UCL	16.85		
95% Adjusted Gamma UCL	17.17		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.35
	or 95% Modified-t UCL	16.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options
From File 222-01.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Aluminum

General Statistics
Number of Valid Observations 12 Number of Distinct Observations 9

Raw Statistics		Log-transformed Statistics	
Minimum	3110	Minimum of Log Data	8.042
Maximum	14200	Maximum of Log Data	9.561
Mean	9530	Mean of log Data	9.1
Median	10197	SD of log Data	0.409
SD	2951		
Coefficient of Variation	0.31		
Skewness	-0.866		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.793
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11060	95% H-UCL	12508
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14712
95% Adjusted-CLT UCL (Chen-1995)	10703	97.5% Chebyshev (MVUE) UCL	16897
95% Modified-t UCL (Johnson-1978)	11024	99% Chebyshev (MVUE) UCL	21191

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.178	Data appear Normal at 5% Significance Level	
Theta Star	1543		
MLE of Mean	9530		
MLE of Standard Deviation	3834		
nu star	148.3		
Approximate Chi Square Value (.05)	121.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10931
Adjusted Chi Square Value	117.4	95% Jackknife UCL	11060
		95% Standard Bootstrap UCL	10868
Anderson-Darling Test Statistic	0.898	95% Bootstrap-t UCL	10805
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10841
Kolmogorov-Smirnov Test Statistic	0.271	95% Percentile Bootstrap UCL	10778
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	10691
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13243
		97.5% Chebyshev(Mean, Sd) UCL	14849
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18005
95% Approximate Gamma UCL	11665		
95% Adjusted Gamma UCL	12037		

Potential UCL to Use Use 95% Student's-t UCL 11060

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	4	Minimum of Log Data	1.386
Maximum	11.84	Maximum of Log Data	2.471
Mean	8.904	Mean of log Data	2.14
Median	9.47	SD of log Data	0.341
SD	2.463		
Coefficient of Variation	0.277		
Skewness	-1.01		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.813
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.18	95% H-UCL	11.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.86
95% Adjusted-CLT UCL (Chen-1995)	9.852	97.5% Chebyshev (MVUE) UCL	14.54
95% Modified-t UCL (Johnson-1978)	10.15	99% Chebyshev (MVUE) UCL	17.85
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.31	Data appear Normal at 5% Significance Level	
Theta Star	1.072		
MLE of Mean	8.904		
MLE of Standard Deviation	3.089		
nu star	199.4		
Approximate Chi Square Value (.05)	167.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.07
Adjusted Chi Square Value	163.3	95% Jackknife UCL	10.18
		95% Standard Bootstrap UCL	10.02
Anderson-Darling Test Statistic	0.808	95% Bootstrap-t UCL	9.984
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	9.883
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	9.997
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	9.874
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12
		97.5% Chebyshev(Mean, Sd) UCL	13.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.98
95% Approximate Gamma UCL	10.59		
95% Adjusted Gamma UCL	10.87		
Potential UCL to Use		Use 95% Student's-t UCL	10.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	-0.0143	Log Statistics Not Avaliable
Maximum	0.393	
Mean	0.189	
Median	0.189	
SD	0.0868	
Coefficient of Variation	0.459	
Skewness	-1.73E-15	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Not Available	
Shapiro Wilk Critical Value	0.859		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.234	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.234	95% Adjusted-CLT UCL (Chen 1995)	0.231
		95% Modified-t UCL (Johnson-1978)	0.234

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.299	95% CLT UCL	0.231
		95% Jackknife UCL	0.234
		95% Standard Bootstrap UCL	N/A
		95% Bootstrap-t UCL	N/A
		95% Hall's Bootstrap UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% Chebyshev(Mean, Sd) UCL	0.299
		97.5% Chebyshev(Mean, Sd) UCL	0.346
		99% Chebyshev(Mean, Sd) UCL	0.439

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	12.8	Minimum of Log Data	2.549
Maximum	85	Maximum of Log Data	4.443
Mean	50.13	Mean of log Data	3.726
Median	43.65	SD of log Data	0.689
SD	28.21		
Coefficient of Variation	0.563		
Skewness	0.0748		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.76	95% H-UCL	86.63
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.85
95% Adjusted-CLT UCL (Chen-1995)	63.72	97.5% Chebyshev (MVUE) UCL	117.9
95% Modified-t UCL (Johnson-1978)	64.79	99% Chebyshev (MVUE) UCL	157.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.165	Data appear Normal at 5% Significance Level	
Theta Star	23.16		
MLE of Mean	50.13		
MLE of Standard Deviation	34.07		
nu star	51.96		
Approximate Chi Square Value (.05)	36.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	63.53
Adjusted Chi Square Value	34.42	95% Jackknife UCL	64.76
		95% Standard Bootstrap UCL	63.2
Anderson-Darling Test Statistic	0.486	95% Bootstrap-t UCL	65.59
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	61.7
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	63.76
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	62.77
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.63
		97.5% Chebyshev(Mean, Sd) UCL	101
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	131.2
95% Approximate Gamma UCL	71.56		
95% Adjusted Gamma UCL	75.67		
Potential UCL to Use		Use 95% Student's-t UCL	64.76

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt-60 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	223.2	Minimum of Log Data	5.408
Maximum	889	Maximum of Log Data	6.79
Mean	515.5	Mean of log Data	6.153
Median	491.3	SD of log Data	0.456
SD	226.3		
Coefficient of Variation	0.439		
Skewness	4.79E-01		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	632.8	95% H-UCL	694.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	818.8
95% Adjusted-CLT UCL (Chen-1995)	632.6	97.5% Chebyshev (MVUE) UCL	949.5
95% Modified-t UCL (Johnson-1978)	634.3	99% Chebyshev (MVUE) UCL	1206
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.243	Data appear Normal at 5% Significance Level	
Theta Star	121.5		
MLE of Mean	515.5		
MLE of Standard Deviation	250.2		
nu star	101.8		
Approximate Chi Square Value (.05)	79.55	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	622.9
Adjusted Chi Square Value	76.55	95% Jackknife UCL	632.8
		95% Standard Bootstrap UCL	616.7
Anderson-Darling Test Statistic	0.231	95% Bootstrap-t UCL	647.4
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	622
Kolmogorov-Smirnov Test Statistic	0.136	95% Percentile Bootstrap UCL	616.1
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	629
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	800.3
		97.5% Chebyshev(Mean, Sd) UCL	923.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1166
95% Approximate Gamma UCL	659.9		
95% Adjusted Gamma UCL	685.7		
Potential UCL to Use		Use 95% Student's-t UCL	632.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	9	Minimum of Log Data	2.197
Maximum	91.9	Maximum of Log Data	4.521
Mean	57.51	Mean of log Data	3.817
Median	65	SD of log Data	0.849
SD	29.33		
Coefficient of Variation	0.51		
Skewness	-0.894		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.722
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.71	95% H-UCL	128.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	133.5
95% Adjusted-CLT UCL (Chen-1995)	69.1	97.5% Chebyshev (MVUE) UCL	164.1
95% Modified-t UCL (Johnson-1978)	72.35	99% Chebyshev (MVUE) UCL	224.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.766	Data do not follow a Discernable Distribution (0.05)	
Theta Star	32.56		
MLE of Mean	57.51		
MLE of Standard Deviation	43.27		
nu star	42.38		
Approximate Chi Square Value (.05)	28.46	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	71.44
Adjusted Chi Square Value	26.73	95% Jackknife UCL	72.71
		95% Standard Bootstrap UCL	70.94
Anderson-Darling Test Statistic	1.488	95% Bootstrap-t UCL	70.09
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	68.71
Kolmogorov-Smirnov Test Statistic	0.363	95% Percentile Bootstrap UCL	69.9
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	68.97
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.41
		97.5% Chebyshev(Mean, Sd) UCL	110.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	141.8
95% Approximate Gamma UCL	85.65		
95% Adjusted Gamma UCL	91.2		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	94.41
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.08	Minimum of Log Data	-2.526
Maximum	1.4	Maximum of Log Data	0.336
Mean	0.57	Mean of log Data	-0.746
Median	0.574	SD of log Data	0.727
SD	0.315		
Coefficient of Variation	0.554		
Skewness	1.349		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.688	Shapiro Wilk Test Statistic	0.687
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.733	95% H-UCL	1.058
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.177
95% Adjusted-CLT UCL (Chen-1995)	0.757	97.5% Chebyshev (MVUE) UCL	1.426
95% Modified-t UCL (Johnson-1978)	0.739	99% Chebyshev (MVUE) UCL	1.914

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.221	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.256		
MLE of Mean	0.57		
MLE of Standard Deviation	0.382		
nu star	53.31		
Approximate Chi Square Value (.05)	37.53	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.719
Adjusted Chi Square Value	35.52	95% Jackknife UCL	0.733
		95% Standard Bootstrap UCL	0.711
Anderson-Darling Test Statistic	1.976	95% Bootstrap-t UCL	0.771
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	1.559
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	0.714
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	0.749
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.967
		97.5% Chebyshev(Mean, Sd) UCL	1.138
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.476
95% Approximate Gamma UCL	0.809		
95% Adjusted Gamma UCL	0.855		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	0.967

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	1.1	Minimum of Log Data	0.0953
Maximum	58.6	Maximum of Log Data	4.071
Mean	17	Mean of log Data	2.479
Median	15.84	SD of log Data	0.995
SD	14.75		
Coefficient of Variation	0.868		
Skewness	2.193		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.744	Shapiro Wilk Test Statistic	0.878
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.65	95% H-UCL	46.86
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43.32
95% Adjusted-CLT UCL (Chen-1995)	26.88	97.5% Chebyshev (MVUE) UCL	54.04
95% Modified-t UCL (Johnson-1978)	25.09	99% Chebyshev (MVUE) UCL	75.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.225	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	13.88		
MLE of Mean	17		
MLE of Standard Deviation	15.36		
nu star	29.4		
Approximate Chi Square Value (.05)	18.02	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	24
Adjusted Chi Square Value	16.67	95% Jackknife UCL	24.65
		95% Standard Bootstrap UCL	23.8
Anderson-Darling Test Statistic	0.587	95% Bootstrap-t UCL	30.42
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	55.72
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	24.15
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	26.76
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	35.56
		97.5% Chebyshev(Mean, Sd) UCL	43.59
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	59.36
95% Approximate Gamma UCL	27.73		
95% Adjusted Gamma UCL	29.97		

Potential UCL to Use		Use 95% Approximate Gamma UCL	27.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.77	Minimum of Log Data	0.571
Maximum	10.4	Maximum of Log Data	2.342
Mean	6.085	Mean of log Data	1.748
Median	6.085	SD of log Data	0.401
SD	1.84		
Coefficient of Variation	0.302		
Skewness	9.96E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.531
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.039	95% H-UCL	7.952
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.347
95% Adjusted-CLT UCL (Chen-1995)	6.959	97.5% Chebyshev (MVUE) UCL	10.72
95% Modified-t UCL (Johnson-1978)	7.039	99% Chebyshev (MVUE) UCL	13.41

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.617	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.92		
MLE of Mean	6.085		
MLE of Standard Deviation	2.366		
nu star	158.8		
Approximate Chi Square Value (.05)	130.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.959
Adjusted Chi Square Value	126.8	95% Jackknife UCL	7.039
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.823	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.4
		97.5% Chebyshev(Mean, Sd) UCL	9.402
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.37
95% Approximate Gamma UCL	7.395		
95% Adjusted Gamma UCL	7.622		

Potential UCL to Use		
	Use 95% Student's-t UCL	7.039
	or 95% Modified-t UCL	7.039

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.43	Minimum of Log Data	0.358
Maximum	19.6	Maximum of Log Data	2.976
Mean	10.52	Mean of log Data	2.238
Median	10.52	SD of log Data	0.619
SD	3.874		
Coefficient of Variation	0.368		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.52	95% H-UCL	17.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.13
95% Adjusted-CLT UCL (Chen-1995)	12.35	97.5% Chebyshev (MVUE) UCL	24.02
95% Modified-t UCL (Johnson-1978)	12.52	99% Chebyshev (MVUE) UCL	31.65

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.454	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.044		
MLE of Mean	10.52		
MLE of Standard Deviation	5.657		
nu star	82.91		
Approximate Chi Square Value (.05)	62.92	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.35
Adjusted Chi Square Value	60.27	95% Jackknife UCL	12.52
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.93	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.39
		97.5% Chebyshev(Mean, Sd) UCL	17.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.64
95% Approximate Gamma UCL	13.85		
95% Adjusted Gamma UCL	14.46		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	15.39

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	222-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	14.1	Minimum of Log Data	2.646
Maximum	85	Maximum of Log Data	4.443
Mean	71.99	Mean of log Data	4.176
Median	85	SD of log Data	0.555
SD	24.64		
Coefficient of Variation	0.342		
Skewness	-1.68		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.603	Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	84.76	95% H-UCL	109.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	128.6
95% Adjusted-CLT UCL (Chen-1995)	80	97.5% Chebyshev (MVUE) UCL	151.9
95% Modified-t UCL (Johnson-1978)	84.18	99% Chebyshev (MVUE) UCL	197.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.899	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.46		
MLE of Mean	71.99		
MLE of Standard Deviation	36.46		
nu star	93.57		
Approximate Chi Square Value (.05)	72.26	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	83.69
Adjusted Chi Square Value	69.41	95% Jackknife UCL	84.76
		95% Standard Bootstrap UCL	82.39
Anderson-Darling Test Statistic	2.429	95% Bootstrap-t UCL	81.53
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	80.23
Kolmogorov-Smirnov Test Statistic	0.453	95% Percentile Bootstrap UCL	81.86
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	79.09
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	103
		97.5% Chebyshev(Mean, Sd) UCL	116.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	142.8
95% Approximate Gamma UCL	93.21		
95% Adjusted Gamma UCL	97.04		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	103

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	9	Minimum of Log Data	2.197
Maximum	91.9	Maximum of Log Data	4.521
Mean	61.02	Mean of log Data	3.943
Median	65	SD of log Data	0.741
SD	25.17		
Coefficient of Variation	0.413		
Skewness	-1.359		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.756	Shapiro Wilk Test Statistic	0.621
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.07	95% H-UCL	118
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	130.4
95% Adjusted-CLT UCL (Chen-1995)	69.93	97.5% Chebyshev (MVUE) UCL	158.3
95% Modified-t UCL (Johnson-1978)	73.6	99% Chebyshev (MVUE) UCL	213

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.403	Data do not follow a Discernable Distribution (0.05)	
Theta Star	25.39		
MLE of Mean	61.02		
MLE of Standard Deviation	39.36		
nu star	57.68		
Approximate Chi Square Value (.05)	41.22	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	72.98
Adjusted Chi Square Value	39.1	95% Jackknife UCL	74.07
		95% Standard Bootstrap UCL	72.58
Anderson-Darling Test Statistic	2.107	95% Bootstrap-t UCL	71.68
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	70.04
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	71.81
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	70.35
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	92.7
		97.5% Chebyshev(Mean, Sd) UCL	106.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	133.3
95% Approximate Gamma UCL	85.39		
95% Adjusted Gamma UCL	90.01		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	92.7
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable PCB, Total was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	9.6	Minimum of Log Data	2.262
Maximum	58.6	Maximum of Log Data	4.071
Mean	21.66	Mean of log Data	2.979
Median	20	SD of log Data	0.424
SD	12.19		
Coefficient of Variation	0.563		
Skewness	2.869		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.536	Shapiro Wilk Test Statistic	0.69
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27.98	95% H-UCL	27.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	32.96
95% Adjusted-CLT UCL (Chen-1995)	30.56	97.5% Chebyshev (MVUE) UCL	37.98
95% Modified-t UCL (Johnson-1978)	28.46	99% Chebyshev (MVUE) UCL	47.85

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.082	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.305		
MLE of Mean	21.66		
MLE of Standard Deviation	10.72		
nu star	97.97		
Approximate Chi Square Value (.05)	76.14	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	27.44
Adjusted Chi Square Value	73.2	95% Jackknife UCL	27.98
		95% Standard Bootstrap UCL	27.38
Anderson-Darling Test Statistic	2.164	95% Bootstrap-t UCL	34.17
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	55.84
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	28.26
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	29.65
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	36.99
		97.5% Chebyshev(Mean, Sd) UCL	43.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	56.67
95% Approximate Gamma UCL	27.87		
95% Adjusted Gamma UCL	28.98		

Potential UCL to Use		
	Use 95% Student's-t UCL	27.98
	or 95% Modified-t UCL	28.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	227-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	4.54	Minimum of Log Data	1.513
Maximum	11	Maximum of Log Data	2.398
Mean	7.947	Mean of log Data	2.046
Median	7.947	SD of log Data	0.24
SD	1.842		
Coefficient of Variation	0.232		
Skewness	0.203		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.458	95% H-UCL	8.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.34
95% Adjusted-CLT UCL (Chen-1995)	8.456	97.5% Chebyshev (MVUE) UCL	9.939
95% Modified-t UCL (Johnson-1978)	8.46	99% Chebyshev (MVUE) UCL	11.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.04	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.466		
MLE of Mean	7.947		
MLE of Standard Deviation	1.925		
nu star	1261		
Approximate Chi Square Value (.05)	1179	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	8.445
Adjusted Chi Square Value	1176	95% Jackknife UCL	8.458
		95% Standard Bootstrap UCL	8.425
Anderson-Darling Test Statistic	1.909	95% Bootstrap-t UCL	8.452
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	8.457
Kolmogorov-Smirnov Test Statistic	0.253	95% Percentile Bootstrap UCL	8.441
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	8.472
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.267
		97.5% Chebyshev(Mean, Sd) UCL	9.838
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.96
95% Approximate Gamma UCL	8.496		
95% Adjusted Gamma UCL	8.52		

Potential UCL to Use		
	Use 95% Student's-t UCL	8.458
	or 95% Modified-t UCL	8.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.454	Minimum of Log Data	-0.79
Maximum	0.79	Maximum of Log Data	-0.236
Mean	0.537	Mean of log Data	-0.626
Median	0.537	SD of log Data	0.0781
SD	0.0477		
Coefficient of Variation	0.089		
Skewness	4.082		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.441	Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.55	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.567
95% Adjusted-CLT UCL (Chen-1995)	0.555	97.5% Chebyshev (MVUE) UCL	0.58
95% Modified-t UCL (Johnson-1978)	0.551	99% Chebyshev (MVUE) UCL	0.605

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	142.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00376		
MLE of Mean	0.537		
MLE of Standard Deviation	0.0449		
nu star	10570		
Approximate Chi Square Value (.05)	10332	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	0.55
Adjusted Chi Square Value	10322	95% Jackknife UCL	0.55
		95% Standard Bootstrap UCL	0.549
Anderson-Darling Test Statistic	8.063	95% Bootstrap-t UCL	0.558
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.611
Kolmogorov-Smirnov Test Statistic	0.408	95% Percentile Bootstrap UCL	0.551
Kolmogorov-Smirnov 5% Critical Value	0.144	95% BCA Bootstrap UCL	0.556
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.571
		97.5% Chebyshev(Mean, Sd) UCL	0.586
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.615
95% Approximate Gamma UCL	0.549		
95% Adjusted Gamma UCL	0.55		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.55
	or 95% Modified-t UCL	0.551

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics
Minimum	-0.038	Log Statistics Not Avaliable
Maximum	0.51	
Mean	0.113	
Median	0.113	
SD	0.0756	
Coefficient of Variation	0.668	
Skewness	3.821	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.399	Not Available
Shapiro Wilk Critical Value	0.936	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.134	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.134	95% Adjusted-CLT UCL (Chen 1995)	0.142
		95% Modified-t UCL (Johnson-1978)	0.135

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.167	95% CLT UCL	0.134
		95% Jackknife UCL	0.134
		95% Standard Bootstrap UCL	0.133
		95% Bootstrap-t UCL	0.144
		95% Hall's Bootstrap UCL	0.235
		95% Percentile Bootstrap UCL	0.136
		95% BCA Bootstrap UCL	0.143
		95% Chebyshev(Mean, Sd) UCL	0.167
		97.5% Chebyshev(Mean, Sd) UCL	0.191
		99% Chebyshev(Mean, Sd) UCL	0.237

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	7.38	Minimum of Log Data	1.999
Maximum	85	Maximum of Log Data	4.443
Mean	41.32	Mean of log Data	3.619
Median	41.32	SD of log Data	0.509
SD	16.91		
Coefficient of Variation	0.409		
Skewness	0.787		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk Test Statistic	0.728
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	46.01	95% H-UCL	50
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.51
95% Adjusted-CLT UCL (Chen-1995)	46.27	97.5% Chebyshev (MVUE) UCL	65.52
95% Modified-t UCL (Johnson-1978)	46.07	99% Chebyshev (MVUE) UCL	79.29

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.669	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.85		
MLE of Mean	41.32		
MLE of Standard Deviation	19.12		
nu star	345.5		
Approximate Chi Square Value (.05)	303.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	45.89
Adjusted Chi Square Value	301.7	95% Jackknife UCL	46.01
		95% Standard Bootstrap UCL	45.84
Anderson-Darling Test Statistic	4.54	95% Bootstrap-t UCL	46.73
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	46.96
Kolmogorov-Smirnov Test Statistic	3.04E-01	95% Percentile Bootstrap UCL	45.82
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	46.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	53.44
		97.5% Chebyshev(Mean, Sd) UCL	58.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	68.98
95% Approximate Gamma UCL	47.05		
95% Adjusted Gamma UCL	47.31		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	53.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.0318	Log Statistics Not Avaliable
Maximum	1.53E-02	
Mean	-0.00478	
Median	-0.00478	
SD	0.00573	
Coefficient of Variation	-1.198	
Skewness	-1.763	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.372	Not Available
Shapiro Wilk Critical Value	0.936	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	-0.00319	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	-0.00319	95% Adjusted-CLT UCL (Chen 1995)	-0.00353
		95% Modified-t UCL (Johnson-1978)	-0.00324

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	-6.78E-04	95% CLT UCL	-0.00323
		95% Jackknife UCL	-0.00319
		95% Standard Bootstrap UCL	-0.00323
		95% Bootstrap-t UCL	-0.00343
		95% Hall's Bootstrap UCL	-0.00331
		95% Percentile Bootstrap UCL	-0.00332
		95% BCA Bootstrap UCL	-0.00368
		95% Chebyshev(Mean, Sd) UCL	-6.78E-04
		97.5% Chebyshev(Mean, Sd) UCL	0.0011
		99% Chebyshev(Mean, Sd) UCL	0.00459

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	4.83E-04	Minimum of Log Data	-7.635
Maximum	2.53	Maximum of Log Data	0.928
Mean	0.527	Mean of log Data	-1.012
Median	0.527	SD of log Data	1.395
SD	0.373		
Coefficient of Variation	0.708		
Skewness	4.252		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.381	Shapiro Wilk Test Statistic	0.437
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.631	95% H-UCL	1.876
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.074
95% Adjusted-CLT UCL (Chen-1995)	0.674	97.5% Chebyshev (MVUE) UCL	2.575
95% Modified-t UCL (Johnson-1978)	0.638	99% Chebyshev (MVUE) UCL	3.559

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.385	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.381		
MLE of Mean	0.527		
MLE of Standard Deviation	0.448		
nu star	102.5		
Approximate Chi Square Value (.05)	80.12	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	0.628
Adjusted Chi Square Value	79.26	95% Jackknife UCL	0.631
		95% Standard Bootstrap UCL	0.631
Anderson-Darling Test Statistic	9.839	95% Bootstrap-t UCL	0.689
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	1.094
Kolmogorov-Smirnov Test Statistic	0.501	95% Percentile Bootstrap UCL	0.636
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	0.676
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.795
		97.5% Chebyshev(Mean, Sd) UCL	0.911
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.138
95% Approximate Gamma UCL	0.675		
95% Adjusted Gamma UCL	0.682		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.795

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	7.21	Minimum of Log Data	1.975
Maximum	653	Maximum of Log Data	6.482
Mean	115.6	Mean of log Data	4.338
Median	115.6	SD of log Data	1.036
SD	116.4		
Coefficient of Variation	1.008		
Skewness	3.209		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	147.9	95% H-UCL	199.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	239.5
95% Adjusted-CLT UCL (Chen-1995)	157.8	97.5% Chebyshev (MVUE) UCL	287.7
95% Modified-t UCL (Johnson-1978)	149.5	99% Chebyshev (MVUE) UCL	382.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.264	Data do not follow a Discernable Distribution (0.05)	
Theta Star	91.4		
MLE of Mean	115.6		
MLE of Standard Deviation	102.8		
nu star	93.55		
Approximate Chi Square Value (.05)	72.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	147
Adjusted Chi Square Value	71.43	95% Jackknife UCL	147.9
		95% Standard Bootstrap UCL	146.4
Anderson-Darling Test Statistic	2.635	95% Bootstrap-t UCL	175
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	313.9
Kolmogorov-Smirnov Test Statistic	0.278	95% Percentile Bootstrap UCL	150.5
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	159.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	199
		97.5% Chebyshev(Mean, Sd) UCL	235.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	306
95% Approximate Gamma UCL	149.6		
95% Adjusted Gamma UCL	151.3		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	199

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	5	Maximum of Log Data	1.609
Mean	2.47	Mean of log Data	0.202
Median	2.47	SD of log Data	1.485
SD	2.046		
Coefficient of Variation	0.828		
Skewness	0.195		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.801
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.037	95% H-UCL	7.738
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.241
95% Adjusted-CLT UCL (Chen-1995)	3.034	97.5% Chebyshev (MVUE) UCL	10.3
95% Modified-t UCL (Johnson-1978)	3.039	99% Chebyshev (MVUE) UCL	14.35

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.79	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.127		
MLE of Mean	2.47		
MLE of Standard Deviation	2.779		
nu star	58.45		
Approximate Chi Square Value (.05)	41.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	3.023
Adjusted Chi Square Value	41.26	95% Jackknife UCL	3.037
		95% Standard Bootstrap UCL	3.014
Anderson-Darling Test Statistic	2.236	95% Bootstrap-t UCL	3.059
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	3.022
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	3.026
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	2.999
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.936
		97.5% Chebyshev(Mean, Sd) UCL	4.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.816
95% Approximate Gamma UCL	3.447		
95% Adjusted Gamma UCL	3.498		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.936

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics
Minimum	-0.534	Log Statistics Not Avaliable
Maximum	152	
Mean	24.9	
Median	24.9	
SD	23.58	
Coefficient of Variation	0.947	
Skewness	4.451	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.447	Not Available
Shapiro Wilk Critical Value	0.936	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	31.44	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	31.44	95% Adjusted-CLT UCL (Chen 1995)	34.3
		95% Modified-t UCL (Johnson-1978)	31.91

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	41.79	95% CLT UCL	31.27
		95% Jackknife UCL	31.44
		95% Standard Bootstrap UCL	31.31
		95% Bootstrap-t UCL	36.81
		95% Hall's Bootstrap UCL	60.88
		95% Percentile Bootstrap UCL	31.94
		95% BCA Bootstrap UCL	35.15
		95% Chebyshev(Mean, Sd) UCL	41.79
		97.5% Chebyshev(Mean, Sd) UCL	49.11
		99% Chebyshev(Mean, Sd) UCL	63.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.16	Minimum of Log Data	-1.833
Maximum	20	Maximum of Log Data	2.996
Mean	12.83	Mean of log Data	2.391
Median	12.83	SD of log Data	0.901
SD	3.505		
Coefficient of Variation	0.273		
Skewness	-2.142		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.553	Shapiro Wilk Test Statistic	0.336
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.81	95% H-UCL	23.07
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.98
95% Adjusted-CLT UCL (Chen-1995)	13.56	97.5% Chebyshev (MVUE) UCL	33.1
95% Modified-t UCL (Johnson-1978)	13.77	99% Chebyshev (MVUE) UCL	43.15

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.011	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.262		
MLE of Mean	12.83		
MLE of Standard Deviation	7.396		
nu star	222.8		
Approximate Chi Square Value (.05)	189.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	13.78
Adjusted Chi Square Value	187.9	95% Jackknife UCL	13.81
		95% Standard Bootstrap UCL	13.76
Anderson-Darling Test Statistic	10.2	95% Bootstrap-t UCL	13.65
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	13.64
Kolmogorov-Smirnov Test Statistic	0.52	95% Percentile Bootstrap UCL	13.72
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	13.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.35
		97.5% Chebyshev(Mean, Sd) UCL	16.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.57
95% Approximate Gamma UCL	15.11		
95% Adjusted Gamma UCL	15.22		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	15.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.0083	Minimum of Log Data	-4.791
Maximum	0.5	Maximum of Log Data	-0.693
Mean	0.342	Mean of log Data	-1.21
Median	0.342	SD of log Data	0.788
SD	0.092		
Coefficient of Variation	0.269		
Skewness	-2.226		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.543	Shapiro Wilk Test Statistic	0.344
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.367	95% H-UCL	0.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.654
95% Adjusted-CLT UCL (Chen-1995)	0.361	97.5% Chebyshev (MVUE) UCL	0.763
95% Modified-t UCL (Johnson-1978)	0.366	99% Chebyshev (MVUE) UCL	0.977

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.537	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0966		
MLE of Mean	0.342		
MLE of Standard Deviation	0.182		
nu star	261.7		
Approximate Chi Square Value (.05)	225.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	0.367
Adjusted Chi Square Value	223.8	95% Jackknife UCL	0.367
		95% Standard Bootstrap UCL	0.367
Anderson-Darling Test Statistic	9.985	95% Bootstrap-t UCL	0.363
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	0.362
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	0.364
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	0.362
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.408
		97.5% Chebyshev(Mean, Sd) UCL	0.436
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.492
95% Approximate Gamma UCL	0.397		
95% Adjusted Gamma UCL	0.4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.408

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	1.34	Minimum of Log Data	0.293
Maximum	438	Maximum of Log Data	6.082
Mean	49.06	Mean of log Data	3.397
Median	49.06	SD of log Data	1.014
SD	73.3		
Coefficient of Variation	1.494		
Skewness	4.59		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.41	95% H-UCL	74.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.35
95% Adjusted-CLT UCL (Chen-1995)	78.6	97.5% Chebyshev (MVUE) UCL	108.3
95% Modified-t UCL (Johnson-1978)	70.92	99% Chebyshev (MVUE) UCL	143.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.07	Data do not follow a Discernable Distribution (0.05)	
Theta Star	45.85		
MLE of Mean	49.06		
MLE of Standard Deviation	47.43		
nu star	79.19		
Approximate Chi Square Value (.05)	59.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	68.88
Adjusted Chi Square Value	58.95	95% Jackknife UCL	69.41
		95% Standard Bootstrap UCL	68.7
Anderson-Darling Test Statistic	2.825	95% Bootstrap-t UCL	114
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	170.6
Kolmogorov-Smirnov Test Statistic	0.322	95% Percentile Bootstrap UCL	70.09
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	86.77
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.6
		97.5% Chebyshev(Mean, Sd) UCL	124.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	169
95% Approximate Gamma UCL	65.09		
95% Adjusted Gamma UCL	65.91		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	101.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.276	Minimum of Log Data	-1.287
Maximum	48.1	Maximum of Log Data	3.873
Mean	8.854	Mean of log Data	1.904
Median	8.854	SD of log Data	0.926
SD	7.169		
Coefficient of Variation	0.81		
Skewness	4.623		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.378	Shapiro Wilk Test Statistic	0.543
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.84	95% H-UCL	14.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.83
95% Adjusted-CLT UCL (Chen-1995)	11.75	97.5% Chebyshev (MVUE) UCL	21.15
95% Modified-t UCL (Johnson-1978)	10.99	99% Chebyshev (MVUE) UCL	27.69

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.818	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.871		
MLE of Mean	8.854		
MLE of Standard Deviation	6.567		
nu star	134.5		
Approximate Chi Square Value (.05)	108.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	10.79
Adjusted Chi Square Value	107.7	95% Jackknife UCL	10.84
		95% Standard Bootstrap UCL	10.74
Anderson-Darling Test Statistic	8.651	95% Bootstrap-t UCL	12.55
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	19.33
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	10.79
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	11.91
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.99
		97.5% Chebyshev(Mean, Sd) UCL	16.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.58
95% Approximate Gamma UCL	10.95		
95% Adjusted Gamma UCL	11.06		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	13.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0187	Minimum of Log Data	-3.979
Maximum	4.7	Maximum of Log Data	1.548
Mean	0.842	Mean of log Data	-0.494
Median	0.842	SD of log Data	1.043
SD	0.705		
Coefficient of Variation	0.836		
Skewness	4.626		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.377	Shapiro Wilk Test Statistic	0.533
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.038	95% H-UCL	1.607
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.931
95% Adjusted-CLT UCL (Chen-1995)	1.127	97.5% Chebyshev (MVUE) UCL	2.321
95% Modified-t UCL (Johnson-1978)	1.053	99% Chebyshev (MVUE) UCL	3.088

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.579	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.533		
MLE of Mean	0.842		
MLE of Standard Deviation	0.67		
nu star	116.9		
Approximate Chi Square Value (.05)	92.91	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	1.033
Adjusted Chi Square Value	91.98	95% Jackknife UCL	1.038
		95% Standard Bootstrap UCL	1.031
Anderson-Darling Test Statistic	8.777	95% Bootstrap-t UCL	1.178
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	1.891
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	1.071
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	1.155
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.347
		97.5% Chebyshev(Mean, Sd) UCL	1.566
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.995
95% Approximate Gamma UCL	1.06		
95% Adjusted Gamma UCL	1.07		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.347

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.359	Minimum of Log Data	-1.024
Maximum	146	Maximum of Log Data	4.984
Mean	26.11	Mean of log Data	2.914
Median	26.11	SD of log Data	1.125
SD	21.9		
Coefficient of Variation	0.839		
Skewness	4.62		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.377	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.19	95% H-UCL	55.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.26
95% Adjusted-CLT UCL (Chen-1995)	34.95	97.5% Chebyshev (MVUE) UCL	80.32
95% Modified-t UCL (Johnson-1978)	32.64	99% Chebyshev (MVUE) UCL	107.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.471	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.76		
MLE of Mean	26.11		
MLE of Standard Deviation	21.53		
nu star	108.8		
Approximate Chi Square Value (.05)	85.74	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	32.03
Adjusted Chi Square Value	84.85	95% Jackknife UCL	32.19
		95% Standard Bootstrap UCL	32.08
Anderson-Darling Test Statistic	8.84	95% Bootstrap-t UCL	36.54
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	58.13
Kolmogorov-Smirnov Test Statistic	0.47	95% Percentile Bootstrap UCL	32.59
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	36.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	41.8
		97.5% Chebyshev(Mean, Sd) UCL	48.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	61.94
95% Approximate Gamma UCL	33.14		
95% Adjusted Gamma UCL	33.48		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	41.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	227-02.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	4.47	Minimum of Log Data	1.5
Maximum	11	Maximum of Log Data	2.4
Mean	7.793	Mean of log Data	2.03
Median	7.793	SD of log Data	0.25
SD	1.806		
Coefficient of Variation	0.232		
Skewness	-0.0701		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.344	95% H-UCL	8.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.36
95% Adjusted-CLT UCL (Chen-1995)	8.323	97.5% Chebyshev (MVUE) UCL	10
95% Modified-t UCL (Johnson-1978)	8.343	99% Chebyshev (MVUE) UCL	11.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.97	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.488		
MLE of Mean	7.793		
MLE of Standard Deviation	1.95		
nu star	990.2		
Approximate Chi Square Value (.05)	918.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	8.33
Adjusted Chi Square Value	914.4	95% Jackknife UCL	8.34
		95% Standard Bootstrap UCL	8.33
Anderson-Darling Test Statistic	2.664	95% Bootstrap-t UCL	8.33
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	8.34
Kolmogorov-Smirnov Test Statistic	0.306	95% Percentile Bootstrap UCL	8.3
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	8.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.21
		97.5% Chebyshev(Mean, Sd) UCL	9.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11
95% Approximate Gamma UCL	8.405		
95% Adjusted Gamma UCL	8.44		

Potential UCL to Use		
	Use 95% Student's-t UCL	8.34
	or 95% Modified-t UCL	8.34

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	66.8	Minimum of Log Data	4.2
Maximum	275	Maximum of Log Data	5.62
Mean	124.2	Mean of log Data	4.79
Median	124.2	SD of log Data	0.25
SD	35.81		
Coefficient of Variation	0.288		
Skewness	2.567		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.58	Shapiro Wilk Test Statistic	0.67
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	135.1	95% H-UCL	135
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	149
95% Adjusted-CLT UCL (Chen-1995)	138	97.5% Chebyshev (MVUE) UCL	160
95% Modified-t UCL (Johnson-1978)	135.6	99% Chebyshev (MVUE) UCL	181

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.04	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.849		
MLE of Mean	124.2		
MLE of Standard Deviation	33.16		
nu star	870.4		
Approximate Chi Square Value (.05)	802.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	135
Adjusted Chi Square Value	799.3	95% Jackknife UCL	135
		95% Standard Bootstrap UCL	135
Anderson-Darling Test Statistic	5.46	95% Bootstrap-t UCL	141
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	202
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	135
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	139
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	152
		97.5% Chebyshev(Mean, Sd) UCL	164
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	188
95% Approximate Gamma UCL	134.7		
95% Adjusted Gamma UCL	135.3		

Potential UCL to Use		
	Use 95% Student's-t UCL	135
	or 95% Modified-t UCL	136

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.24	Minimum of Log Data	-1.4
Maximum	0.9	Maximum of Log Data	-0.1
Mean	0.535	Mean of log Data	-0.6
Median	0.535	SD of log Data	0.19
SD	0.0936		
Coefficient of Variation	0.175		
Skewness	1.155		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.564	Shapiro Wilk Test Statistic	0.55
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.563	95% H-UCL	0.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.61
95% Adjusted-CLT UCL (Chen-1995)	0.566	97.5% Chebyshev (MVUE) UCL	0.65
95% Modified-t UCL (Johnson-1978)	0.564	99% Chebyshev (MVUE) UCL	0.72

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	29.29	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0183		
MLE of Mean	0.535		
MLE of Standard Deviation	0.0988		
nu star	1816		
Approximate Chi Square Value (.05)	1718	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.56
Adjusted Chi Square Value	1713	95% Jackknife UCL	0.56
		95% Standard Bootstrap UCL	0.56
Anderson-Darling Test Statistic	6.388	95% Bootstrap-t UCL	0.57
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.61
Kolmogorov-Smirnov Test Statistic	0.412	95% Percentile Bootstrap UCL	0.56
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.57
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.61
		97.5% Chebyshev(Mean, Sd) UCL	0.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.7
95% Approximate Gamma UCL	0.565		
95% Adjusted Gamma UCL	0.567		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.56
	or 95% Modified-t UCL	0.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	9.4	Minimum of Log Data	2.24
Maximum	85	Maximum of Log Data	4.44
Mean	34.28	Mean of log Data	3.43
Median	34.28	SD of log Data	0.5
SD	14.28		
Coefficient of Variation	0.417		
Skewness	1.034		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.73
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	38.63	95% H-UCL	41.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.4
95% Adjusted-CLT UCL (Chen-1995)	39.01	97.5% Chebyshev (MVUE) UCL	55.6
95% Modified-t UCL (Johnson-1978)	38.71	99% Chebyshev (MVUE) UCL	67.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.615	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.429		
MLE of Mean	34.28		
MLE of Standard Deviation	15.96		
nu star	286.1		
Approximate Chi Square Value (.05)	247.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	38.5
Adjusted Chi Square Value	246	95% Jackknife UCL	38.6
		95% Standard Bootstrap UCL	38.5
Anderson-Darling Test Statistic	3.825	95% Bootstrap-t UCL	39
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	40.7
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	38.6
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	45.5
		97.5% Chebyshev(Mean, Sd) UCL	50.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	59.8
95% Approximate Gamma UCL	39.56		
95% Adjusted Gamma UCL	39.87		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	45.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	2.97	Minimum of Log Data	1.09
Maximum	24.4	Maximum of Log Data	3.2
Mean	9.569	Mean of log Data	2.2
Median	9.569	SD of log Data	0.35
SD	3.408		
Coefficient of Variation	0.356		
Skewness	2.561		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.563	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.61	95% H-UCL	10.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.3
95% Adjusted-CLT UCL (Chen-1995)	10.88	97.5% Chebyshev (MVUE) UCL	13.4
95% Modified-t UCL (Johnson-1978)	10.65	99% Chebyshev (MVUE) UCL	15.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.422	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.136		
MLE of Mean	9.569		
MLE of Standard Deviation	3.297		
nu star	522.2		
Approximate Chi Square Value (.05)	470.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	10.6
Adjusted Chi Square Value	467.5	95% Jackknife UCL	10.6
		95% Standard Bootstrap UCL	10.5
Anderson-Darling Test Statistic	5.877	95% Bootstrap-t UCL	11
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	16.8
Kolmogorov-Smirnov Test Statistic	0.392	95% Percentile Bootstrap UCL	10.7
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	10.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.2
		97.5% Chebyshev(Mean, Sd) UCL	13.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.7
95% Approximate Gamma UCL	10.63		
95% Adjusted Gamma UCL	10.69		
Potential UCL to Use		Use 95% Student's-t UCL	10.6
		or 95% Modified-t UCL	10.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics
Minimum	-0.00684	Log Statistics Not Avaliable
Maximum	0.0347	
Mean	0.00885	
Median	0.00885	
SD	0.00617	
Coefficient of Variation	0.697	
Skewness	1.596	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.463	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0107	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0107	95% Adjusted-CLT UCL (Chen 1995)	0.01
		95% Modified-t UCL (Johnson-1978)	0.01

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0137	95% CLT UCL	0.01
		95% Jackknife UCL	0.01
		95% Standard Bootstrap UCL	0.01
		95% Bootstrap-t UCL	0.01
		95% Hall's Bootstrap UCL	0.01
		95% Percentile Bootstrap UCL	0.01
		95% BCA Bootstrap UCL	0.01
		95% Chebyshev(Mean, Sd) UCL	0.01
		97.5% Chebyshev(Mean, Sd) UCL	0.02
		99% Chebyshev(Mean, Sd) UCL	0.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	193	Minimum of Log Data	5.26
Maximum	2390	Maximum of Log Data	7.78
Mean	619.6	Mean of log Data	6.31
Median	619.6	SD of log Data	0.48
SD	387.4		
Coefficient of Variation	0.625		
Skewness	3.383		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.616	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	737.7	95% H-UCL	725
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	849
95% Adjusted-CLT UCL (Chen-1995)	779.2	97.5% Chebyshev (MVUE) UCL	952
95% Modified-t UCL (Johnson-1978)	744.8	99% Chebyshev (MVUE) UCL	1153

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.874	Data do not follow a Discernable Distribution (0.05)	
Theta Star	159.9		
MLE of Mean	619.6		
MLE of Standard Deviation	314.8		
nu star	240.2		
Approximate Chi Square Value (.05)	205.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	734
Adjusted Chi Square Value	203.5	95% Jackknife UCL	738
		95% Standard Bootstrap UCL	731
Anderson-Darling Test Statistic	2.475	95% Bootstrap-t UCL	839
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	1273
Kolmogorov-Smirnov Test Statistic	0.287	95% Percentile Bootstrap UCL	735
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	795
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	923
		97.5% Chebyshev(Mean, Sd) UCL	1054
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1312
95% Approximate Gamma UCL	724.9		
95% Adjusted Gamma UCL	731.2		

Potential UCL to Use		
	Use 95% Student's-t UCL	738
	or 95% Modified-t UCL	745

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	0.0266	Minimum of Log Data	-3.6
Maximum	10	Maximum of Log Data	2.3
Mean	5.737	Mean of log Data	1.06
Median	5.737	SD of log Data	1.83
SD	3.303		
Coefficient of Variation	0.576		
Skewness	-0.509		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.806	Shapiro Wilk Test Statistic	0.61
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.744	95% H-UCL	50.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.4
95% Adjusted-CLT UCL (Chen-1995)	6.655	97.5% Chebyshev (MVUE) UCL	50.6
95% Modified-t UCL (Johnson-1978)	6.735	99% Chebyshev (MVUE) UCL	72.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.795	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.213		
MLE of Mean	5.737		
MLE of Standard Deviation	6.433		
nu star	49.32		
Approximate Chi Square Value (.05)	34.19	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	6.71
Adjusted Chi Square Value	33.49	95% Jackknife UCL	6.74
		95% Standard Bootstrap UCL	6.69
Anderson-Darling Test Statistic	5.244	95% Bootstrap-t UCL	6.71
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	6.67
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	6.7
Kolmogorov-Smirnov 5% Critical Value	0.163	95% BCA Bootstrap UCL	6.65
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.32
		97.5% Chebyshev(Mean, Sd) UCL	9.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.6
95% Approximate Gamma UCL	8.274		
95% Adjusted Gamma UCL	8.447		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.32

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics
Minimum	-0.0044	Log Statistics Not Avaliable
Maximum	0.085	
Mean	0.0278	
Median	0.0278	
SD	0.0134	
Coefficient of Variation	0.48	
Skewness	2.106	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.526	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0319	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0319	95% Adjusted-CLT UCL (Chen 1995)	0.03
		95% Modified-t UCL (Johnson-1978)	0.03

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0383	95% CLT UCL	0.03
		95% Jackknife UCL	0.03
		95% Standard Bootstrap UCL	0.03
		95% Bootstrap-t UCL	0.03
		95% Hall's Bootstrap UCL	0.06
		95% Percentile Bootstrap UCL	0.03
		95% BCA Bootstrap UCL	0.03
		95% Chebyshev(Mean, Sd) UCL	0.04
		97.5% Chebyshev(Mean, Sd) UCL	0.04
		99% Chebyshev(Mean, Sd) UCL	0.05

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	4.52	Minimum of Log Data	1.51
Maximum	192.4	Maximum of Log Data	5.26
Mean	89.95	Mean of log Data	4.27
Median	89.95	SD of log Data	0.91
SD	42.38		
Coefficient of Variation	0.471		
Skewness	0.0721		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.62
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	102.9	95% H-UCL	157
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	190
95% Adjusted-CLT UCL (Chen-1995)	102.6	97.5% Chebyshev (MVUE) UCL	226
95% Modified-t UCL (Johnson-1978)	102.9	99% Chebyshev (MVUE) UCL	298
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.099	Data do not follow a Discernable Distribution (0.05)	
Theta Star	42.85		
MLE of Mean	89.95		
MLE of Standard Deviation	62.09		
nu star	130.1		
Approximate Chi Square Value (.05)	104.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	103
Adjusted Chi Square Value	103.5	95% Jackknife UCL	103
		95% Standard Bootstrap UCL	103
Anderson-Darling Test Statistic	4.673	95% Bootstrap-t UCL	103
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	104
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	102
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	102
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	123
		97.5% Chebyshev(Mean, Sd) UCL	138
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	166
95% Approximate Gamma UCL	111.7		
95% Adjusted Gamma UCL	113.1		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	123

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.1
Maximum	12.6	Maximum of Log Data	2.53
Mean	3.406	Mean of log Data	0.67
Median	3.406	SD of log Data	1.31
SD	2.922		
Coefficient of Variation	0.858		
Skewness	1.244		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.297	95% H-UCL	9.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.92
95% Adjusted-CLT UCL (Chen-1995)	4.395	97.5% Chebyshev (MVUE) UCL	12.3
95% Modified-t UCL (Johnson-1978)	4.317	99% Chebyshev (MVUE) UCL	17

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.951	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	3.581		
MLE of Mean	3.406		
MLE of Standard Deviation	3.493		
nu star	58.98		
Approximate Chi Square Value (.05)	42.32	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	4.27
Adjusted Chi Square Value	41.54	95% Jackknife UCL	4.3
		95% Standard Bootstrap UCL	4.27
Anderson-Darling Test Statistic	0.906	95% Bootstrap-t UCL	4.43
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	4.59
Kolmogorov-Smirnov Test Statistic	0.157	95% Percentile Bootstrap UCL	4.29
Kolmogorov-Smirnov 5% Critical Value	0.162	95% BCA Bootstrap UCL	4.4
Data follow Appr. Gamma Distribution at 5% Significance Lev		95% Chebyshev(Mean, Sd) UCL	5.69
		97.5% Chebyshev(Mean, Sd) UCL	6.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.63
95% Approximate Gamma UCL	4.747		
95% Adjusted Gamma UCL	4.837		

Potential UCL to Use	Use 95% Approximate Gamma UCL	4.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	0.031	Minimum of Log Data	-3.5
Maximum	10.07	Maximum of Log Data	2.31
Mean	6.235	Mean of log Data	1.53
Median	6.235	SD of log Data	1.2
SD	2.919		
Coefficient of Variation	0.468		
Skewness	-0.405		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.57
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.125	95% H-UCL	16.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.3
95% Adjusted-CLT UCL (Chen-1995)	7.056	97.5% Chebyshev (MVUE) UCL	23.8
95% Modified-t UCL (Johnson-1978)	7.118	99% Chebyshev (MVUE) UCL	32.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.648	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.784		
MLE of Mean	6.235		
MLE of Standard Deviation	4.857		
nu star	102.2		
Approximate Chi Square Value (.05)	79.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	7.1
Adjusted Chi Square Value	78.75	95% Jackknife UCL	7.13
		95% Standard Bootstrap UCL	7.1
Anderson-Darling Test Statistic	3.489	95% Bootstrap-t UCL	7.08
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	7.05
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	7.05
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	7.07
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.52
		97.5% Chebyshev(Mean, Sd) UCL	9.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.5
95% Approximate Gamma UCL	7.978		
95% Adjusted Gamma UCL	8.089		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0656	Minimum of Log Data	-2.7
Maximum	0.49	Maximum of Log Data	-0.7
Mean	0.34	Mean of log Data	-1.1
Median	0.34	SD of log Data	0.37
SD	0.08		
Coefficient of Variation	0.235		
Skewness	-1.589		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.584	Shapiro Wilk Test Statistic	0.46
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.365	95% H-UCL	0.39
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.45
95% Adjusted-CLT UCL (Chen-1995)	0.359	97.5% Chebyshev (MVUE) UCL	0.5
95% Modified-t UCL (Johnson-1978)	0.364	99% Chebyshev (MVUE) UCL	0.59

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.599	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0354		
MLE of Mean	0.34		
MLE of Standard Deviation	0.11		
nu star	595.2		
Approximate Chi Square Value (.05)	539.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.36
Adjusted Chi Square Value	536.6	95% Jackknife UCL	0.37
		95% Standard Bootstrap UCL	0.36
Anderson-Darling Test Statistic	7.084	95% Bootstrap-t UCL	0.36
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.36
Kolmogorov-Smirnov Test Statistic	0.476	95% Percentile Bootstrap UCL	0.36
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.4
		97.5% Chebyshev(Mean, Sd) UCL	0.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.48
95% Approximate Gamma UCL	0.375		
95% Adjusted Gamma UCL	0.377		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.37
	or 95% Modified-t UCL	0.36

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	1.11	Minimum of Log Data	0.1
Maximum	200	Maximum of Log Data	5.3
Mean	23.29	Mean of log Data	2.75
Median	23.29	SD of log Data	0.91
SD	33.64		
Coefficient of Variation	1.445		
Skewness	5.12		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.358	Shapiro Wilk Test Statistic	0.77
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	33.54	95% H-UCL	34.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.8
95% Adjusted-CLT UCL (Chen-1995)	39.16	97.5% Chebyshev (MVUE) UCL	49.8
95% Modified-t UCL (Johnson-1978)	34.47	99% Chebyshev (MVUE) UCL	65.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.288	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.08		
MLE of Mean	23.29		
MLE of Standard Deviation	20.52		
nu star	79.85		
Approximate Chi Square Value (.05)	60.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	33.2
Adjusted Chi Square Value	59.31	95% Jackknife UCL	33.5
		95% Standard Bootstrap UCL	32.9
Anderson-Darling Test Statistic	3.272	95% Bootstrap-t UCL	54.5
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	75.8
Kolmogorov-Smirnov Test Statistic	0.356	95% Percentile Bootstrap UCL	34.9
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	41.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	49.6
		97.5% Chebyshev(Mean, Sd) UCL	61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	83.4
95% Approximate Gamma UCL	30.86		
95% Adjusted Gamma UCL	31.35		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	49.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.373	Minimum of Log Data	-1
Maximum	2.45	Maximum of Log Data	0.9
Mean	1.473	Mean of log Data	0.35
Median	1.473	SD of log Data	0.31
SD	0.328		
Coefficient of Variation	0.223		
Skewness	-0.715		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.48
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.573	95% H-UCL	1.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.86
95% Adjusted-CLT UCL (Chen-1995)	1.562	97.5% Chebyshev (MVUE) UCL	2.01
95% Modified-t UCL (Johnson-1978)	1.572	99% Chebyshev (MVUE) UCL	2.33

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.84	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.115		
MLE of Mean	1.473		
MLE of Standard Deviation	0.411		
nu star	796.1		
Approximate Chi Square Value (.05)	731.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	1.57
Adjusted Chi Square Value	728.2	95% Jackknife UCL	1.57
		95% Standard Bootstrap UCL	1.57
Anderson-Darling Test Statistic	7.344	95% Bootstrap-t UCL	1.56
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1.58
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	1.56
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	1.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.73
		97.5% Chebyshev(Mean, Sd) UCL	1.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.06
95% Approximate Gamma UCL	1.603		
95% Adjusted Gamma UCL	1.61		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.57
	or 95% Modified-t UCL	1.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	14.2	Minimum of Log Data	2.65
Maximum	39.2	Maximum of Log Data	3.67
Mean	23.33	Mean of log Data	3.14
Median	23.33	SD of log Data	0.17
SD	4.072		
Coefficient of Variation	0.175		
Skewness	1.562		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.647	Shapiro Wilk Test Statistic	0.68
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.57	95% H-UCL	24.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.4
95% Adjusted-CLT UCL (Chen-1995)	24.75	97.5% Chebyshev (MVUE) UCL	27.8
95% Modified-t UCL (Johnson-1978)	24.6	99% Chebyshev (MVUE) UCL	30.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	32.87	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.71		
MLE of Mean	23.33		
MLE of Standard Deviation	4.069		
nu star	2038		
Approximate Chi Square Value (.05)	1934	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	24.5
Adjusted Chi Square Value	1929	95% Jackknife UCL	24.6
		95% Standard Bootstrap UCL	24.5
Anderson-Darling Test Statistic	5.36	95% Bootstrap-t UCL	24.8
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	25.9
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	24.6
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	24.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.5
		97.5% Chebyshev(Mean, Sd) UCL	27.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.6
95% Approximate Gamma UCL	24.58		
95% Adjusted Gamma UCL	24.65		

Potential UCL to Use		
	Use 95% Student's-t UCL	24.6
	or 95% Modified-t UCL	24.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	227-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Beryllium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.454	Minimum of Log Data	-0.79
Maximum	0.79	Maximum of Log Data	-0.236
Mean	0.539	Mean of log Data	-0.621
Median	0.539	SD of log Data	0.077
SD	0.0472		
Coefficient of Variation	0.0876		
Skewness	4.092		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.395	Shapiro Wilk Test Statistic	0.441
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.552	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.568
95% Adjusted-CLT UCL (Chen-1995)	0.557	97.5% Chebyshev (MVUE) UCL	0.581
95% Modified-t UCL (Johnson-1978)	0.553	99% Chebyshev (MVUE) UCL	0.607

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	147	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00366		
MLE of Mean	0.539		
MLE of Standard Deviation	0.0444		
nu star	10882		
Approximate Chi Square Value (.05)	10640	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	0.552
Adjusted Chi Square Value	10630	95% Jackknife UCL	0.552
		95% Standard Bootstrap UCL	0.551
Anderson-Darling Test Statistic	9.33	95% Bootstrap-t UCL	0.559
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.612
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	0.554
Kolmogorov-Smirnov 5% Critical Value	0.144	95% BCA Bootstrap UCL	0.558
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.573
		97.5% Chebyshev(Mean, Sd) UCL	0.587
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.616
95% Approximate Gamma UCL	0.551		
95% Adjusted Gamma UCL	0.552		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.552
	or 95% Modified-t UCL	0.553

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics
Minimum	-0.038	Log Statistics Not Avaliable
Maximum	0.51	
Mean	0.138	
Median	0.138	
SD	0.072	
Coefficient of Variation	0.52	
Skewness	3.462	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.397	Not Available
Shapiro Wilk Critical Value	0.936	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.158	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.158	95% Adjusted-CLT UCL (Chen 1995)	0.165
		95% Modified-t UCL (Johnson-1978)	0.16

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.19	95% CLT UCL	0.158
		95% Jackknife UCL	0.158
		95% Standard Bootstrap UCL	0.158
		95% Bootstrap-t UCL	0.165
		95% Hall's Bootstrap UCL	0.262
		95% Percentile Bootstrap UCL	0.159
		95% BCA Bootstrap UCL	0.169
		95% Chebyshev(Mean, Sd) UCL	0.19
		97.5% Chebyshev(Mean, Sd) UCL	0.212
		99% Chebyshev(Mean, Sd) UCL	0.256

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	7.38	Minimum of Log Data	1.999
Maximum	85	Maximum of Log Data	4.443
Mean	45.45	Mean of log Data	3.678
Median	45.45	SD of log Data	0.595
SD	21.21		
Coefficient of Variation	0.467		
Skewness	0.473		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Test Statistic	0.787
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	51.33	95% H-UCL	57.55
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	68.33
95% Adjusted-CLT UCL (Chen-1995)	51.47	97.5% Chebyshev (MVUE) UCL	77.57
95% Modified-t UCL (Johnson-1978)	51.38	99% Chebyshev (MVUE) UCL	95.71

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.486	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.04		
MLE of Mean	45.45		
MLE of Standard Deviation	24.34		
nu star	257.9		
Approximate Chi Square Value (.05)	221.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	51.18
Adjusted Chi Square Value	220.3	95% Jackknife UCL	51.33
		95% Standard Bootstrap UCL	51.03
Anderson-Darling Test Statistic	3.14	95% Bootstrap-t UCL	51.86
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	51.84
Kolmogorov-Smirnov Test Statistic	0.244	95% Percentile Bootstrap UCL	51.25
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	51.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	60.65
		97.5% Chebyshev(Mean, Sd) UCL	67.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	80.14
95% Approximate Gamma UCL	52.86		
95% Adjusted Gamma UCL	53.21		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	60.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.0318	Log Statistics Not Avaliable
Maximum	0.0153	
Mean	-0.00478	
Median	-0.00478	
SD	0.00573	
Coefficient of Variation	-1.198	
Skewness	-1.763	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.372	Not Available
Shapiro Wilk Critical Value	0.936	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	-0.00319	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	-0.00319	95% Adjusted-CLT UCL (Chen 1995)	-0.00353
		95% Modified-t UCL (Johnson-1978)	-0.00324

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	-6.78E-04	95% CLT UCL	-0.00323
		95% Jackknife UCL	-0.00319
		95% Standard Bootstrap UCL	-0.00321
		95% Bootstrap-t UCL	-0.00343
		95% Hall's Bootstrap UCL	-0.00331
		95% Percentile Bootstrap UCL	-0.00332
		95% BCA Bootstrap UCL	-0.0037
		95% Chebyshev(Mean, Sd) UCL	-6.78E-04
		97.5% Chebyshev(Mean, Sd) UCL	0.0011
		99% Chebyshev(Mean, Sd) UCL	0.00459

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	4.83E-04	Minimum of Log Data	-7.635
Maximum	2.53	Maximum of Log Data	0.928
Mean	0.646	Mean of log Data	-0.771
Median	0.646	SD of log Data	1.402
SD	0.363		
Coefficient of Variation	0.562		
Skewness	3.661		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.382	Shapiro Wilk Test Statistic	0.376
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.746	95% H-UCL	2.426
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.674
95% Adjusted-CLT UCL (Chen-1995)	0.782	97.5% Chebyshev (MVUE) UCL	3.322
95% Modified-t UCL (Johnson-1978)	0.752	99% Chebyshev (MVUE) UCL	4.595

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.532	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.421		
MLE of Mean	0.646		
MLE of Standard Deviation	0.521		
nu star	113.4		
Approximate Chi Square Value (.05)	89.82	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	0.744
Adjusted Chi Square Value	88.91	95% Jackknife UCL	0.746
		95% Standard Bootstrap UCL	0.739
Anderson-Darling Test Statistic	10.98	95% Bootstrap-t UCL	0.787
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	1.238
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	0.747
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.798
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.905
		97.5% Chebyshev(Mean, Sd) UCL	1.018
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.239
95% Approximate Gamma UCL	0.815		
95% Adjusted Gamma UCL	0.823		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.905

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	8.64	Minimum of Log Data	2.156
Maximum	653	Maximum of Log Data	6.482
Mean	120.5	Mean of log Data	4.428
Median	120.5	SD of log Data	0.966
SD	115.1		
Coefficient of Variation	0.955		
Skewness	3.207		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.628	Shapiro Wilk Test Statistic	0.809
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	152.4	95% H-UCL	195
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	235.9
95% Adjusted-CLT UCL (Chen-1995)	162.3	97.5% Chebyshev (MVUE) UCL	281.2
95% Modified-t UCL (Johnson-1978)	154.1	99% Chebyshev (MVUE) UCL	370.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.414	Data do not follow a Discernable Distribution (0.05)	
Theta Star	85.22		
MLE of Mean	120.5		
MLE of Standard Deviation	101.3		
nu star	104.6		
Approximate Chi Square Value (.05)	82.02	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	151.6
Adjusted Chi Square Value	81.15	95% Jackknife UCL	152.4
		95% Standard Bootstrap UCL	151.3
Anderson-Darling Test Statistic	2.731	95% Bootstrap-t UCL	175.4
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	296.6
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	155.1
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	167.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	203
		97.5% Chebyshev(Mean, Sd) UCL	238.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	308.8
95% Approximate Gamma UCL	153.7		
95% Adjusted Gamma UCL	155.3		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	203

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	37	Number of Distinct Observations	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	5	Maximum of Log Data	1.609
Mean	2.703	Mean of log Data	0.375
Median	2.703	SD of log Data	1.434
SD	2.01		
Coefficient of Variation	0.744		
Skewness	-0.0238		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.261	95% H-UCL	8.197
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.921
95% Adjusted-CLT UCL (Chen-1995)	3.245	97.5% Chebyshev (MVUE) UCL	11.11
95% Modified-t UCL (Johnson-1978)	3.26	99% Chebyshev (MVUE) UCL	15.41
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.881	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.066		
MLE of Mean	2.703		
MLE of Standard Deviation	2.879		
nu star	65.23		
Approximate Chi Square Value (.05)	47.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	3.246
Adjusted Chi Square Value	46.99	95% Jackknife UCL	3.261
		95% Standard Bootstrap UCL	3.24
Anderson-Darling Test Statistic	2.629	95% Bootstrap-t UCL	3.233
Anderson-Darling 5% Critical Value	0.78	95% Hall's Bootstrap UCL	3.224
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	3.218
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	3.223
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.143
		97.5% Chebyshev(Mean, Sd) UCL	4.766
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.991
95% Approximate Gamma UCL	3.7		
95% Adjusted Gamma UCL	3.751		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	4.143

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics
Minimum	-0.534	Log Statistics Not Avaliable
Maximum	152	
Mean	31.4	
Median	31.4	
SD	22.78	
Coefficient of Variation	0.726	
Skewness	4.086	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.442	Not Available
Shapiro Wilk Critical Value	0.936	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	37.72	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	37.72	95% Adjusted-CLT UCL (Chen 1995)		40.25
		95% Modified-t UCL (Johnson-1978)		38.14

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	47.72	95% CLT UCL	37.56
		95% Jackknife UCL	37.72
		95% Standard Bootstrap UCL	37.42
		95% Bootstrap-t UCL	41.56
		95% Hall's Bootstrap UCL	66.89
		95% Percentile Bootstrap UCL	37.73
		95% BCA Bootstrap UCL	40.47
		95% Chebyshev(Mean, Sd) UCL	47.72
		97.5% Chebyshev(Mean, Sd) UCL	54.79
		99% Chebyshev(Mean, Sd) UCL	68.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.018	Minimum of Log Data	-4.017
Maximum	0.5	Maximum of Log Data	-0.693
Mean	0.378	Mean of log Data	-1.034
Median	0.378	SD of log Data	0.51
SD	0.0691		
Coefficient of Variation	0.183		
Skewness	-3.774		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.438	Shapiro Wilk Test Statistic	0.252
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.397	95% H-UCL	0.477
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.558
95% Adjusted-CLT UCL (Chen-1995)	0.389	97.5% Chebyshev (MVUE) UCL	0.625
95% Modified-t UCL (Johnson-1978)	0.396	99% Chebyshev (MVUE) UCL	0.757

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.831	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0482		
MLE of Mean	0.378		
MLE of Standard Deviation	0.135		
nu star	579.5		
Approximate Chi Square Value (.05)	524.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	0.396
Adjusted Chi Square Value	522.4	95% Jackknife UCL	0.397
		95% Standard Bootstrap UCL	0.396
Anderson-Darling Test Statistic	10.59	95% Bootstrap-t UCL	0.393
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	0.391
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	0.393
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	0.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.427
		97.5% Chebyshev(Mean, Sd) UCL	0.449
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.491
95% Approximate Gamma UCL	0.417		
95% Adjusted Gamma UCL	0.419		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.427

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	1.34	Minimum of Log Data	0.293
Maximum	438	Maximum of Log Data	6.082
Mean	49.06	Mean of log Data	3.397
Median	49.06	SD of log Data	1.014
SD	73.3		
Coefficient of Variation	1.494		
Skewness	4.59		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.41	95% H-UCL	74.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.35
95% Adjusted-CLT UCL (Chen-1995)	78.6	97.5% Chebyshev (MVUE) UCL	108.3
95% Modified-t UCL (Johnson-1978)	70.92	99% Chebyshev (MVUE) UCL	143.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.07	Data do not follow a Discernable Distribution (0.05)	
Theta Star	45.85		
MLE of Mean	49.06		
MLE of Standard Deviation	47.43		
nu star	79.19		
Approximate Chi Square Value (.05)	59.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	68.88
Adjusted Chi Square Value	58.95	95% Jackknife UCL	69.41
		95% Standard Bootstrap UCL	68.5
Anderson-Darling Test Statistic	2.825	95% Bootstrap-t UCL	114.5
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	170.9
Kolmogorov-Smirnov Test Statistic	0.322	95% Percentile Bootstrap UCL	71.31
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	81
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	101.6
		97.5% Chebyshev(Mean, Sd) UCL	124.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	169
95% Approximate Gamma UCL	65.09		
95% Adjusted Gamma UCL	65.91		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	101.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.276	Minimum of Log Data	-1.287
Maximum	48.1	Maximum of Log Data	3.873
Mean	10.4	Mean of log Data	2.1
Median	10.4	SD of log Data	0.912
SD	7.028		
Coefficient of Variation	0.676		
Skewness	4.245		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.383	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.35	95% H-UCL	17.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21.26
95% Adjusted-CLT UCL (Chen-1995)	13.16	97.5% Chebyshev (MVUE) UCL	25.19
95% Modified-t UCL (Johnson-1978)	12.49	99% Chebyshev (MVUE) UCL	32.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.055	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.062		
MLE of Mean	10.4		
MLE of Standard Deviation	7.256		
nu star	152.1		
Approximate Chi Square Value (.05)	124.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	12.3
Adjusted Chi Square Value	123.5	95% Jackknife UCL	12.35
		95% Standard Bootstrap UCL	12.25
Anderson-Darling Test Statistic	9.605	95% Bootstrap-t UCL	13.45
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	21.07
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	12.47
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	13.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.44
		97.5% Chebyshev(Mean, Sd) UCL	17.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.9
95% Approximate Gamma UCL	12.7		
95% Adjusted Gamma UCL	12.81		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	15.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0187	Minimum of Log Data	-3.979
Maximum	4.7	Maximum of Log Data	1.548
Mean	0.995	Mean of log Data	-0.285
Median	0.995	SD of log Data	1.024
SD	0.691		
Coefficient of Variation	0.694		
Skewness	4.248		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.382	Shapiro Wilk Test Statistic	0.474
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.187	95% H-UCL	1.919
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.31
95% Adjusted-CLT UCL (Chen-1995)	1.267	97.5% Chebyshev (MVUE) UCL	2.772
95% Modified-t UCL (Johnson-1978)	1.2	99% Chebyshev (MVUE) UCL	3.678

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.794	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.555		
MLE of Mean	0.995		
MLE of Standard Deviation	0.743		
nu star	132.7		
Approximate Chi Square Value (.05)	107.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	1.182
Adjusted Chi Square Value	106.1	95% Jackknife UCL	1.187
		95% Standard Bootstrap UCL	1.179
Anderson-Darling Test Statistic	9.732	95% Bootstrap-t UCL	1.295
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	2.043
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	1.199
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	1.294
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.49
		97.5% Chebyshev(Mean, Sd) UCL	1.704
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.125
95% Approximate Gamma UCL	1.233		
95% Adjusted Gamma UCL	1.245		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	37	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.359	Minimum of Log Data	-1.024
Maximum	146	Maximum of Log Data	4.984
Mean	30.9	Mean of log Data	3.126
Median	30.9	SD of log Data	1.107
SD	21.46		
Coefficient of Variation	0.695		
Skewness	4.242		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.382	Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	36.85	95% H-UCL	66.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.64
95% Adjusted-CLT UCL (Chen-1995)	39.33	97.5% Chebyshev (MVUE) UCL	96.36
95% Modified-t UCL (Johnson-1978)	37.26	99% Chebyshev (MVUE) UCL	129.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.665	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.55		
MLE of Mean	30.9		
MLE of Standard Deviation	23.94		
nu star	123.2		
Approximate Chi Square Value (.05)	98.59	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	36.7
Adjusted Chi Square Value	97.63	95% Jackknife UCL	36.85
		95% Standard Bootstrap UCL	36.7
Anderson-Darling Test Statistic	9.811	95% Bootstrap-t UCL	40.19
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	63.5
Kolmogorov-Smirnov Test Statistic	0.491	95% Percentile Bootstrap UCL	37.12
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	40.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	46.28
		97.5% Chebyshev(Mean, Sd) UCL	52.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	66
95% Approximate Gamma UCL	38.62		
95% Adjusted Gamma UCL	38.99		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	46.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	227-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Beryllium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.452	Minimum of Log Data	-0.794
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.521	Mean of log Data	-0.655
Median	0.521	SD of log Data	0.0646
SD	0.0371		
Coefficient of Variation	0.0712		
Skewness	3.655		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.431	Shapiro Wilk Test Statistic	0.468
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.532	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.547
95% Adjusted-CLT UCL (Chen-1995)	0.536	97.5% Chebyshev (MVUE) UCL	0.559
95% Modified-t UCL (Johnson-1978)	0.533	99% Chebyshev (MVUE) UCL	0.581

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	210.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00248		
MLE of Mean	0.521		
MLE of Standard Deviation	0.0359		
nu star	13036		
Approximate Chi Square Value (.05)	12771	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.532
Adjusted Chi Square Value	12757	95% Jackknife UCL	0.532
		95% Standard Bootstrap UCL	0.532
Anderson-Darling Test Statistic	7.411	95% Bootstrap-t UCL	0.538
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.585
Kolmogorov-Smirnov Test Statistic	0.459	95% Percentile Bootstrap UCL	0.533
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.54
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.55
		97.5% Chebyshev(Mean, Sd) UCL	0.562
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.587
95% Approximate Gamma UCL	0.532		
95% Adjusted Gamma UCL	0.532		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.532
	or 95% Modified-t UCL	0.533

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	8.62	Minimum of Log Data	2.154
Maximum	85	Maximum of Log Data	4.443
Mean	48.45	Mean of log Data	3.719
Median	48.45	SD of log Data	0.66
SD	22.87		
Coefficient of Variation	0.472		
Skewness	0.0544		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.838	Shapiro Wilk Test Statistic	0.758
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	55.42	95% H-UCL	65.74
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.06
95% Adjusted-CLT UCL (Chen-1995)	55.25	97.5% Chebyshev (MVUE) UCL	91.27
95% Modified-t UCL (Johnson-1978)	55.43	99% Chebyshev (MVUE) UCL	115.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.966	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.34		
MLE of Mean	48.45		
MLE of Standard Deviation	28.13		
nu star	183.9		
Approximate Chi Square Value (.05)	153.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	55.2
Adjusted Chi Square Value	152	95% Jackknife UCL	55.42
		95% Standard Bootstrap UCL	55.33
Anderson-Darling Test Statistic	2.745	95% Bootstrap-t UCL	55.54
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	55.5
Kolmogorov-Smirnov Test Statistic	0.316	95% Percentile Bootstrap UCL	55.2
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	55.35
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.35
		97.5% Chebyshev(Mean, Sd) UCL	74.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	89.32
95% Approximate Gamma UCL	58.03		
95% Adjusted Gamma UCL	58.62		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	66.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	2.97	Minimum of Log Data	1.089
Maximum	14.8	Maximum of Log Data	2.695
Mean	8.436	Mean of log Data	2.107
Median	8.436	SD of log Data	0.244
SD	1.806		
Coefficient of Variation	0.214		
Skewness	0.707		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.566	Shapiro Wilk Test Statistic	0.533
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.986	95% H-UCL	9.168
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.1
95% Adjusted-CLT UCL (Chen-1995)	9.013	97.5% Chebyshev (MVUE) UCL	10.81
95% Modified-t UCL (Johnson-1978)	8.993	99% Chebyshev (MVUE) UCL	12.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.03	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.468		
MLE of Mean	8.436		
MLE of Standard Deviation	1.987		
nu star	1118		
Approximate Chi Square Value (.05)	1041	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	8.969
Adjusted Chi Square Value	1037	95% Jackknife UCL	8.986
		95% Standard Bootstrap UCL	8.963
Anderson-Darling Test Statistic	7.019	95% Bootstrap-t UCL	9.017
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	9.346
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	8.95
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	9.015
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.85
		97.5% Chebyshev(Mean, Sd) UCL	10.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.66
95% Approximate Gamma UCL	9.057		
95% Adjusted Gamma UCL	9.093		

Potential UCL to Use		
	Use 95% Student's-t UCL	8.986
	or 95% Modified-t UCL	8.993

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics
Minimum	-0.00684	Log Statistics Not Avaliable
Maximum	0.0347	
Mean	0.00885	
Median	0.00885	
SD	0.00617	
Coefficient of Variation	0.697	
Skewness	1.596	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.463	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0107	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0107	95% Adjusted-CLT UCL (Chen 1995)		0.011
		95% Modified-t UCL (Johnson-1978)		0.0108

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0137	95% CLT UCL	0.0107
		95% Jackknife UCL	0.0107
		95% Standard Bootstrap UCL	0.0107
		95% Bootstrap-t UCL	0.0109
		95% Hall's Bootstrap UCL	0.0129
		95% Percentile Bootstrap UCL	0.0107
		95% BCA Bootstrap UCL	0.0109
		95% Chebyshev(Mean, Sd) UCL	0.0137
		97.5% Chebyshev(Mean, Sd) UCL	0.0158
		99% Chebyshev(Mean, Sd) UCL	0.0199

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.072	Minimum of Log Data	-2.631
Maximum	10	Maximum of Log Data	2.303
Mean	7.256	Mean of log Data	1.533
Median	7.256	SD of log Data	1.529
SD	3.061		
Coefficient of Variation	0.422		
Skewness	-1.557		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.694	Shapiro Wilk Test Statistic	0.482
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.189	95% H-UCL	35.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.94
95% Adjusted-CLT UCL (Chen-1995)	7.996	97.5% Chebyshev (MVUE) UCL	44.06
95% Modified-t UCL (Johnson-1978)	8.163	99% Chebyshev (MVUE) UCL	62

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.154	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.29		
MLE of Mean	7.256		
MLE of Standard Deviation	6.756		
nu star	71.52		
Approximate Chi Square Value (.05)	53.05	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	8.16
Adjusted Chi Square Value	52.17	95% Jackknife UCL	8.189
		95% Standard Bootstrap UCL	8.159
Anderson-Darling Test Statistic	7.072	95% Bootstrap-t UCL	8.024
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	8.066
Kolmogorov-Smirnov Test Statistic	0.489	95% Percentile Bootstrap UCL	8.09
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	8.035
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.652
		97.5% Chebyshev(Mean, Sd) UCL	10.69
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.73
95% Approximate Gamma UCL	9.782		
95% Adjusted Gamma UCL	9.948		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	9.652

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	4.52	Minimum of Log Data	1.509
Maximum	192.4	Maximum of Log Data	5.26
Mean	93.88	Mean of log Data	4.365
Median	93.88	SD of log Data	0.787
SD	39.68		
Coefficient of Variation	0.423		
Skewness	0.0973		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.801	Shapiro Wilk Test Statistic	0.603
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	106	95% H-UCL	146.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	177.7
95% Adjusted-CLT UCL (Chen-1995)	105.7	97.5% Chebyshev (MVUE) UCL	208.8
95% Modified-t UCL (Johnson-1978)	106	99% Chebyshev (MVUE) UCL	269.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.711	Data do not follow a Discernable Distribution (0.05)	
Theta Star	34.63		
MLE of Mean	93.88		
MLE of Standard Deviation	57.01		
nu star	168.1		
Approximate Chi Square Value (.05)	139.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	105.6
Adjusted Chi Square Value	137.6	95% Jackknife UCL	106
		95% Standard Bootstrap UCL	105.5
Anderson-Darling Test Statistic	4.532	95% Bootstrap-t UCL	105.2
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	107.7
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	105.5
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	105.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	124.9
		97.5% Chebyshev(Mean, Sd) UCL	138.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	164.8
95% Approximate Gamma UCL	113.4		
95% Adjusted Gamma UCL	114.6		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	124.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	12.6	Maximum of Log Data	2.534
Mean	3.553	Mean of log Data	0.727
Median	3.553	SD of log Data	1.316
SD	2.897		
Coefficient of Variation	0.815		
Skewness	1.143		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.877	Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.436	95% H-UCL	9.689
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.6
95% Adjusted-CLT UCL (Chen-1995)	4.523	97.5% Chebyshev (MVUE) UCL	13.16
95% Modified-t UCL (Johnson-1978)	4.454	99% Chebyshev (MVUE) UCL	18.19

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.978	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.632		
MLE of Mean	3.553		
MLE of Standard Deviation	3.592		
nu star	60.66		
Approximate Chi Square Value (.05)	43.75	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	4.409
Adjusted Chi Square Value	42.95	95% Jackknife UCL	4.436
		95% Standard Bootstrap UCL	4.416
Anderson-Darling Test Statistic	1.21	95% Bootstrap-t UCL	4.61
Anderson-Darling 5% Critical Value	0.774	95% Hall's Bootstrap UCL	4.719
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	4.433
Kolmogorov-Smirnov 5% Critical Value	0.162	95% BCA Bootstrap UCL	4.491
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.821
		97.5% Chebyshev(Mean, Sd) UCL	6.802
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.73
95% Approximate Gamma UCL	4.927		
95% Adjusted Gamma UCL	5.018		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.821

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0656	Minimum of Log Data	-2.724
Maximum	0.49	Maximum of Log Data	-0.713
Mean	0.326	Mean of log Data	-1.167
Median	0.326	SD of log Data	0.367
SD	0.0788		
Coefficient of Variation	0.242		
Skewness	-1.12		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.562	Shapiro Wilk Test Statistic	0.457
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.35	95% H-UCL	0.376
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.43
95% Adjusted-CLT UCL (Chen-1995)	0.347	97.5% Chebyshev (MVUE) UCL	0.472
95% Modified-t UCL (Johnson-1978)	0.35	99% Chebyshev (MVUE) UCL	0.555

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.747	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0335		
MLE of Mean	0.326		
MLE of Standard Deviation	0.105		
nu star	604.3		
Approximate Chi Square Value (.05)	548.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.35
Adjusted Chi Square Value	545.3	95% Jackknife UCL	0.35
		95% Standard Bootstrap UCL	0.349
Anderson-Darling Test Statistic	7.45	95% Bootstrap-t UCL	0.347
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.351
Kolmogorov-Smirnov Test Statistic	0.476	95% Percentile Bootstrap UCL	0.349
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.346
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.388
		97.5% Chebyshev(Mean, Sd) UCL	0.415
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.467
95% Approximate Gamma UCL	0.36		
95% Adjusted Gamma UCL	0.362		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.35
	or 95% Modified-t UCL	0.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	1.11	Minimum of Log Data	0.104
Maximum	200	Maximum of Log Data	5.298
Mean	25.1	Mean of log Data	2.891
Median	25.1	SD of log Data	0.808
SD	33.32		
Coefficient of Variation	1.328		
Skewness	5.107		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.361	Shapiro Wilk Test Statistic	0.761
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.26	95% H-UCL	34.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.88
95% Adjusted-CLT UCL (Chen-1995)	40.81	97.5% Chebyshev (MVUE) UCL	49.34
95% Modified-t UCL (Johnson-1978)	36.17	99% Chebyshev (MVUE) UCL	63.99

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.517	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.55		
MLE of Mean	25.1		
MLE of Standard Deviation	20.38		
nu star	94.04		
Approximate Chi Square Value (.05)	72.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	34.94
Adjusted Chi Square Value	71.64	95% Jackknife UCL	35.26
		95% Standard Bootstrap UCL	35.06
Anderson-Darling Test Statistic	3.46	95% Bootstrap-t UCL	55.55
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	77.56
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	36.39
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	43.41
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	51.19
		97.5% Chebyshev(Mean, Sd) UCL	62.47
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	84.65
95% Approximate Gamma UCL	32.48		
95% Adjusted Gamma UCL	32.95		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	51.19

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.373	Minimum of Log Data	-0.986
Maximum	2.45	Maximum of Log Data	0.896
Mean	1.473	Mean of log Data	0.352
Median	1.473	SD of log Data	0.309
SD	0.328		
Coefficient of Variation	0.223		
Skewness	-0.715		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.478
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.573	95% H-UCL	1.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.856
95% Adjusted-CLT UCL (Chen-1995)	1.562	97.5% Chebyshev (MVUE) UCL	2.014
95% Modified-t UCL (Johnson-1978)	1.572	99% Chebyshev (MVUE) UCL	2.326

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.84	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.115		
MLE of Mean	1.473		
MLE of Standard Deviation	0.411		
nu star	796.1		
Approximate Chi Square Value (.05)	731.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	1.57
Adjusted Chi Square Value	728.2	95% Jackknife UCL	1.573
		95% Standard Bootstrap UCL	1.568
Anderson-Darling Test Statistic	7.344	95% Bootstrap-t UCL	1.561
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1.575
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	1.563
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	1.556
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.73
		97.5% Chebyshev(Mean, Sd) UCL	1.841
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.06
95% Approximate Gamma UCL	1.603		
95% Adjusted Gamma UCL	1.61		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.573
	or 95% Modified-t UCL	1.572

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options
From File 165-01.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Aluminum

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	6260	Minimum of Log Data	8.742
Maximum	13000	Maximum of Log Data	9.473
Mean	8156	Mean of log Data	9.002
Median	8088	SD of log Data	0.0921
SD	889.6		
Coefficient of Variation	0.109		
Skewness	4.576		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.308	Shapiro Wilk Test Statistic	0.345
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8407	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8699
95% Adjusted-CLT UCL (Chen-1995)	8521	97.5% Chebyshev (MVUE) UCL	8935
95% Modified-t UCL (Johnson-1978)	8426	99% Chebyshev (MVUE) UCL	9400

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	100.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	81.35		
MLE of Mean	8156		
MLE of Standard Deviation	814.5		
nu star	7219		
Approximate Chi Square Value (.05)	7023	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	8400
Adjusted Chi Square Value	7014	95% Jackknife UCL	8407
		95% Standard Bootstrap UCL	8399
Anderson-Darling Test Statistic	11.06	95% Bootstrap-t UCL	8884
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	9827
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	8447
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	8480
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8802
		97.5% Chebyshev(Mean, Sd) UCL	9082
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9631
95% Approximate Gamma UCL	8384		
95% Adjusted Gamma UCL	8395		

Potential UCL to Use		
	Use 95% Student's-t UCL	8407
	or 95% Modified-t UCL	8426

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	2.2	Minimum of Log Data	0.788
Maximum	10	Maximum of Log Data	2.303
Mean	8.274	Mean of log Data	2.096
Median	8.36	SD of log Data	0.228
SD	1.101		
Coefficient of Variation	0.133		
Skewness	-4.88		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.302	Shapiro Wilk Test Statistic	0.241
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.585	95% H-UCL	8.925
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.731
95% Adjusted-CLT UCL (Chen-1995)	8.417	97.5% Chebyshev (MVUE) UCL	10.33
95% Modified-t UCL (Johnson-1978)	8.56	99% Chebyshev (MVUE) UCL	11.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.312		
MLE of Mean	8.274		
MLE of Standard Deviation	1.607		
nu star	1908		
Approximate Chi Square Value (.05)	1808	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	8.576
Adjusted Chi Square Value	1803	95% Jackknife UCL	8.585
		95% Standard Bootstrap UCL	8.578
Anderson-Darling Test Statistic	11.57	95% Bootstrap-t UCL	8.489
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	8.462
Kolmogorov-Smirnov Test Statistic	0.519	95% Percentile Bootstrap UCL	8.526
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	8.486
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.074
		97.5% Chebyshev(Mean, Sd) UCL	9.421
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.1
95% Approximate Gamma UCL	8.734		
95% Adjusted Gamma UCL	8.756		

Potential UCL to Use		
	Use 95% Student's-t UCL	8.585
	or 95% Modified-t UCL	8.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	130.4	Maximum of Log Data	4.87
Mean	50.6	Mean of log Data	3.838
Median	50.63	SD of log Data	0.509
SD	18.03		
Coefficient of Variation	0.356		
Skewness	1.844		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.505	Shapiro Wilk Test Statistic	0.461
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	55.68	95% H-UCL	62.31
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	73.01
95% Adjusted-CLT UCL (Chen-1995)	56.53	97.5% Chebyshev (MVUE) UCL	81.84
95% Modified-t UCL (Johnson-1978)	55.83	99% Chebyshev (MVUE) UCL	99.16

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.493	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.213		
MLE of Mean	50.6		
MLE of Standard Deviation	21.59		
nu star	395.5		
Approximate Chi Square Value (.05)	350.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	55.54
Adjusted Chi Square Value	348.4	95% Jackknife UCL	55.68
		95% Standard Bootstrap UCL	55.57
Anderson-Darling Test Statistic	9.07	95% Bootstrap-t UCL	56.73
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	62.14
Kolmogorov-Smirnov Test Statistic	0.472	95% Percentile Bootstrap UCL	55.52
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	56.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	63.7
		97.5% Chebyshev(Mean, Sd) UCL	69.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	80.51
95% Approximate Gamma UCL	57.11		
95% Adjusted Gamma UCL	57.43		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	63.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	71.8	Minimum of Log Data	4.274
Maximum	1140	Maximum of Log Data	7.039
Mean	481.4	Mean of log Data	6.114
Median	471.7	SD of log Data	0.416
SD	154.6		
Coefficient of Variation	0.321		
Skewness	1.757		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.492	Shapiro Wilk Test Statistic	0.452
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	525	95% H-UCL	561.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	645
95% Adjusted-CLT UCL (Chen-1995)	531.9	97.5% Chebyshev (MVUE) UCL	711.4
95% Modified-t UCL (Johnson-1978)	526.2	99% Chebyshev (MVUE) UCL	841.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.455	Data do not follow a Discernable Distribution (0.05)	
Theta Star	64.58		
MLE of Mean	481.4		
MLE of Standard Deviation	176.3		
nu star	536.8		
Approximate Chi Square Value (.05)	484.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	523.8
Adjusted Chi Square Value	481.8	95% Jackknife UCL	525
		95% Standard Bootstrap UCL	522.6
Anderson-Darling Test Statistic	9.326	95% Bootstrap-t UCL	535.9
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	669.3
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	526.1
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	533.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	593.7
		97.5% Chebyshev(Mean, Sd) UCL	642.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	737.7
95% Approximate Gamma UCL	533.9		
95% Adjusted Gamma UCL	536.4		

Potential UCL to Use		
	Use 95% Student's-t UCL	525
	or 95% Modified-t UCL	526.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.506	Minimum of Log Data	-0.681
Maximum	1.08	Maximum of Log Data	0.077
Mean	0.794	Mean of log Data	-0.234
Median	0.794	SD of log Data	0.0922
SD	0.0686		
Coefficient of Variation	0.0864		
Skewness	-0.0684		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.335	Shapiro Wilk Test Statistic	0.324
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.814	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.848
95% Adjusted-CLT UCL (Chen-1995)	0.813	97.5% Chebyshev (MVUE) UCL	0.871
95% Modified-t UCL (Johnson-1978)	0.814	99% Chebyshev (MVUE) UCL	0.916

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	117.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00675		
MLE of Mean	0.794		
MLE of Standard Deviation	0.0732		
nu star	8473		
Approximate Chi Square Value (.05)	8260	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.813
Adjusted Chi Square Value	8250	95% Jackknife UCL	0.814
		95% Standard Bootstrap UCL	0.813
Anderson-Darling Test Statistic	11.67	95% Bootstrap-t UCL	0.811
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.818
Kolmogorov-Smirnov Test Statistic	0.484	95% Percentile Bootstrap UCL	0.811
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	0.81
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.844
		97.5% Chebyshev(Mean, Sd) UCL	0.866
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.908
95% Approximate Gamma UCL	0.815		
95% Adjusted Gamma UCL	0.816		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.814
	or 95% Modified-t UCL	0.814

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.0145	Log Statistics Not Avaliable
Maximum	8.65	
Mean	2.661	
Median	2.576	
SD	1.115	
Coefficient of Variation	0.419	
Skewness	4.263	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.306	Not Available	
Shapiro Wilk Critical Value	0.935		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.975	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	2.975	95% Adjusted-CLT UCL (Chen 1995)	3.107
		95% Modified-t UCL (Johnson-1978)	2.997

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	3.471	95% CLT UCL	2.966
		95% Jackknife UCL	2.975
		95% Standard Bootstrap UCL	2.957
		95% Bootstrap-t UCL	3.835
		95% Hall's Bootstrap UCL	5.294
		95% Percentile Bootstrap UCL	2.998
		95% BCA Bootstrap UCL	3.07
		95% Chebyshev(Mean, Sd) UCL	3.471
		97.5% Chebyshev(Mean, Sd) UCL	3.822
		99% Chebyshev(Mean, Sd) UCL	4.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	14.85	Minimum of Log Data	2.698
Maximum	66.62	Maximum of Log Data	4.199
Mean	34.16	Mean of log Data	3.514
Median	34.4	SD of log Data	0.194
SD	6.734		
Coefficient of Variation	0.197		
Skewness	2.537		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.441	Shapiro Wilk Test Statistic	0.477
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	36.06	95% H-UCL	36.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.03
95% Adjusted-CLT UCL (Chen-1995)	36.52	97.5% Chebyshev (MVUE) UCL	41.13
95% Modified-t UCL (Johnson-1978)	36.14	99% Chebyshev (MVUE) UCL	45.25

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.22	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.303		
MLE of Mean	34.16		
MLE of Standard Deviation	6.672		
nu star	1888		
Approximate Chi Square Value (.05)	1788	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	36.01
Adjusted Chi Square Value	1784	95% Jackknife UCL	36.06
		95% Standard Bootstrap UCL	36
Anderson-Darling Test Statistic	9.081	95% Bootstrap-t UCL	36.54
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	47.03
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	36.06
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	36.66
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.06
		97.5% Chebyshev(Mean, Sd) UCL	41.17
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	45.33
95% Approximate Gamma UCL	36.07		
95% Adjusted Gamma UCL	36.16		

Potential UCL to Use		
	Use 95% Student's-t UCL	36.06
	or 95% Modified-t UCL	36.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	5.6	Minimum of Log Data	1.723
Maximum	13.1	Maximum of Log Data	2.573
Mean	8.169	Mean of log Data	2.095
Median	8.1	SD of log Data	0.102
SD	0.942		
Coefficient of Variation	0.115		
Skewness	3.72		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.3	Shapiro Wilk Test Statistic	0.326
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.435	95% H-UCL	8.411
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.775
95% Adjusted-CLT UCL (Chen-1995)	8.532	97.5% Chebyshev (MVUE) UCL	9.039
95% Modified-t UCL (Johnson-1978)	8.451	99% Chebyshev (MVUE) UCL	9.556

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	84.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0967		
MLE of Mean	8.169		
MLE of Standard Deviation	0.889		
nu star	6084		
Approximate Chi Square Value (.05)	5903	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	8.428
Adjusted Chi Square Value	5895	95% Jackknife UCL	8.435
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	11.81	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.491	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.854
		97.5% Chebyshev(Mean, Sd) UCL	9.15
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.732
95% Approximate Gamma UCL	8.419		
95% Adjusted Gamma UCL	8.43		

Potential UCL to Use		
	Use 95% Student's-t UCL	8.435
	or 95% Modified-t UCL	8.451

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.097	Minimum of Log Data	-2.333
Maximum	0.9	Maximum of Log Data	-0.105
Mean	0.345	Mean of log Data	-1.112
Median	0.351	SD of log Data	0.327
SD	0.113		
Coefficient of Variation	0.329		
Skewness	2.944		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.452	Shapiro Wilk Test Statistic	0.524
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.377	95% H-UCL	0.383
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.43
95% Adjusted-CLT UCL (Chen-1995)	0.386	97.5% Chebyshev (MVUE) UCL	0.467
95% Modified-t UCL (Johnson-1978)	0.379	99% Chebyshev (MVUE) UCL	0.538

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.752	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0354		
MLE of Mean	0.345		
MLE of Standard Deviation	0.11		
nu star	702.2		
Approximate Chi Square Value (.05)	641.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.376
Adjusted Chi Square Value	639.1	95% Jackknife UCL	0.377
		95% Standard Bootstrap UCL	0.376
Anderson-Darling Test Statistic	8.845	95% Bootstrap-t UCL	0.385
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.546
Kolmogorov-Smirnov Test Statistic	0.451	95% Percentile Bootstrap UCL	0.377
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.388
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.427
		97.5% Chebyshev(Mean, Sd) UCL	0.463
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.533
95% Approximate Gamma UCL	0.378		
95% Adjusted Gamma UCL	0.379		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.377
	or 95% Modified-t UCL	0.379

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.38	Minimum of Log Data	-0.968
Maximum	4.7	Maximum of Log Data	1.548
Mean	1.328	Mean of log Data	0.211
Median	1.293	SD of log Data	0.383
SD	0.63		
Coefficient of Variation	0.474		
Skewness	4.397		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.38	Shapiro Wilk Test Statistic	0.511
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.505	95% H-UCL	1.496
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.705
95% Adjusted-CLT UCL (Chen-1995)	1.583	97.5% Chebyshev (MVUE) UCL	1.869
95% Modified-t UCL (Johnson-1978)	1.518	99% Chebyshev (MVUE) UCL	2.191

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.475	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.205		
MLE of Mean	1.328		
MLE of Standard Deviation	0.522		
nu star	466.2		
Approximate Chi Square Value (.05)	417.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.501
Adjusted Chi Square Value	415.1	95% Jackknife UCL	1.505
		95% Standard Bootstrap UCL	1.498
Anderson-Darling Test Statistic	9.018	95% Bootstrap-t UCL	1.633
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	2.329
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	1.516
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	1.599
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.786
		97.5% Chebyshev(Mean, Sd) UCL	1.984
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.372
95% Approximate Gamma UCL	1.484		
95% Adjusted Gamma UCL	1.492		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.505
	or 95% Modified-t UCL	1.518

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	0.56	Maximum of Log Data	-0.58
Mean	0.407	Mean of log Data	-0.932
Median	0.411	SD of log Data	0.33
SD	0.068		
Coefficient of Variation	0.167		
Skewness	-3.518		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.395	Shapiro Wilk Test Statistic	0.274
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.426	95% H-UCL	0.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.517
95% Adjusted-CLT UCL (Chen-1995)	0.418	97.5% Chebyshev (MVUE) UCL	0.561
95% Modified-t UCL (Johnson-1978)	0.425	99% Chebyshev (MVUE) UCL	0.648
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0284		
MLE of Mean	0.407		
MLE of Standard Deviation	0.108		
nu star	1030		
Approximate Chi Square Value (.05)	956.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.425
Adjusted Chi Square Value	953.5	95% Jackknife UCL	0.426
		95% Standard Bootstrap UCL	0.426
Anderson-Darling Test Statistic	10.67	95% Bootstrap-t UCL	0.422
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	0.421
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	0.423
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.456
		97.5% Chebyshev(Mean, Sd) UCL	0.478
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.52
95% Approximate Gamma UCL	0.438		
95% Adjusted Gamma UCL	0.44		
Potential UCL to Use		Use 95% Student's-t UCL	0.426
		or 95% Modified-t UCL	0.425

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	16.1	Minimum of Log Data	2.779
Maximum	39.2	Maximum of Log Data	3.669
Mean	32.69	Mean of log Data	3.481
Median	32.99	SD of log Data	0.125
SD	3.072		
Coefficient of Variation	0.094		
Skewness	-4.484		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.351	Shapiro Wilk Test Statistic	0.299
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	33.56	95% H-UCL	33.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	35.71
95% Adjusted-CLT UCL (Chen-1995)	33.13	97.5% Chebyshev (MVUE) UCL	37
95% Modified-t UCL (Johnson-1978)	33.49	99% Chebyshev (MVUE) UCL	39.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	73.76	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.443		
MLE of Mean	32.69		
MLE of Standard Deviation	3.807		
nu star	5311		
Approximate Chi Square Value (.05)	5142	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	33.53
Adjusted Chi Square Value	5135	95% Jackknife UCL	33.56
		95% Standard Bootstrap UCL	33.53
Anderson-Darling Test Statistic	10.57	95% Bootstrap-t UCL	33.36
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	33.26
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	33.4
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	33.24
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.92
		97.5% Chebyshev(Mean, Sd) UCL	35.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.79
95% Approximate Gamma UCL	33.76		
95% Adjusted Gamma UCL	33.81		

Potential UCL to Use		
	Use 95% Student's-t UCL	33.56
	or 95% Modified-t UCL	33.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.008	Minimum of Log Data	-4.828
Maximum	51	Maximum of Log Data	3.932
Mean	3.697	Mean of log Data	0.125
Median	2	SD of log Data	1.74
SD	8.526		
Coefficient of Variation	2.306		
Skewness	5.177		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.387	Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.098	95% H-UCL	13.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.63
95% Adjusted-CLT UCL (Chen-1995)	7.344	97.5% Chebyshev (MVUE) UCL	16.07
95% Modified-t UCL (Johnson-1978)	6.302	99% Chebyshev (MVUE) UCL	22.82

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.506	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.301		
MLE of Mean	3.697		
MLE of Standard Deviation	5.195		
nu star	36.46		
Approximate Chi Square Value (.05)	23.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	6.034
Adjusted Chi Square Value	23.17	95% Jackknife UCL	6.098
		95% Standard Bootstrap UCL	5.957
Anderson-Darling Test Statistic	1.251	95% Bootstrap-t UCL	11.21
Anderson-Darling 5% Critical Value	0.809	95% Hall's Bootstrap UCL	13.95
Kolmogorov-Smirnov Test Statistic	0.242	95% Percentile Bootstrap UCL	6.447
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	8.017
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.891
		97.5% Chebyshev(Mean, Sd) UCL	12.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.84
95% Approximate Gamma UCL	5.702		
95% Adjusted Gamma UCL	5.818		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	9.891

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Pentachlorophenol

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	3
Number of Missing Values	1		

Raw Statistics		Log-transformed Statistics	
Minimum	1.7	Minimum of Log Data	0.531
Maximum	2.1	Maximum of Log Data	0.742
Mean	1.963	Mean of log Data	0.674
Median	1.967	SD of log Data	0.0269
SD	0.0503		
Coefficient of Variation	0.0256		
Skewness	-3.72		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.3	Shapiro Wilk Test Statistic	0.291
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	1.977	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		2.001
95% Adjusted-CLT UCL (Chen-1995)	1.971	97.5% Chebyshev (MVUE) UCL		2.018
95% Modified-t UCL (Johnson-1978)	1.976	99% Chebyshev (MVUE) UCL		2.051

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1347	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.00146			
MLE of Mean	1.963			
MLE of Standard Deviation	0.0535			
nu star	96960			
Approximate Chi Square Value (.05)	96237	Nonparametric Statistics		
Adjusted Level of Significance	0.0428	95% CLT UCL		1.977
Adjusted Chi Square Value	96205	95% Jackknife UCL		1.977
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	11.91	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.504	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		1.999
		97.5% Chebyshev(Mean, Sd) UCL		2.015
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		2.046
95% Approximate Gamma UCL	1.978			
95% Adjusted Gamma UCL	1.978			

Potential UCL to Use		
	Use 95% Student's-t UCL	1.977
	or 95% Modified-t UCL	1.976

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Plutonium-239/240

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.00963	Minimum of Log Data	-4.643
Maximum	7.78	Maximum of Log Data	2.052
Mean	2.045	Mean of log Data	0.547
Median	1.964	SD of log Data	0.926
SD	1.046		
Coefficient of Variation	0.512		
Skewness	4.729		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.307	Shapiro Wilk Test Statistic	0.282
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.339	95% H-UCL	3.804
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.614
95% Adjusted-CLT UCL (Chen-1995)	2.478	97.5% Chebyshev (MVUE) UCL	5.481
95% Modified-t UCL (Johnson-1978)	2.362	99% Chebyshev (MVUE) UCL	7.185

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.886	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.708		
MLE of Mean	2.045		
MLE of Standard Deviation	1.204		
nu star	207.8		
Approximate Chi Square Value (.05)	175.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	2.331
Adjusted Chi Square Value	174.1	95% Jackknife UCL	2.339
		95% Standard Bootstrap UCL	2.34
Anderson-Darling Test Statistic	11.02	95% Bootstrap-t UCL	2.751
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	3.844
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	2.394
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	2.502
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.805
		97.5% Chebyshev(Mean, Sd) UCL	3.134
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.78
95% Approximate Gamma UCL	2.422		
95% Adjusted Gamma UCL	2.44		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	2.805

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.22	Minimum of Log Data	-1.514
Maximum	83.3	Maximum of Log Data	4.422
Mean	22.21	Mean of log Data	2.897
Median	22.52	SD of log Data	0.914
SD	12		
Coefficient of Variation	0.541		
Skewness	3.549		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.424	Shapiro Wilk Test Statistic	0.435
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.59	95% H-UCL	39.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	47.53
95% Adjusted-CLT UCL (Chen-1995)	26.76	97.5% Chebyshev (MVUE) UCL	56.38
95% Modified-t UCL (Johnson-1978)	25.79	99% Chebyshev (MVUE) UCL	73.76

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.417	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.189		
MLE of Mean	22.21		
MLE of Standard Deviation	14.29		
nu star	174		
Approximate Chi Square Value (.05)	144.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	25.5
Adjusted Chi Square Value	143.3	95% Jackknife UCL	25.59
		95% Standard Bootstrap UCL	25.44
Anderson-Darling Test Statistic	9.19	95% Bootstrap-t UCL	26.87
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	42.08
Kolmogorov-Smirnov Test Statistic	0.48	95% Percentile Bootstrap UCL	25.56
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	27.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.93
		97.5% Chebyshev(Mean, Sd) UCL	34.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.12
95% Approximate Gamma UCL	26.74		
95% Adjusted Gamma UCL	26.97		

Potential UCL to Use		
	Use 95% Chebyshev (Mean, Sd) UCL	30.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.22	Minimum of Log Data	-1.514
Maximum	11.4	Maximum of Log Data	2.434
Mean	4.797	Mean of log Data	1.449
Median	4.746	SD of log Data	0.665
SD	1.68		
Coefficient of Variation	0.35		
Skewness	1.096		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.38
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.27	95% H-UCL	6.688
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.027
95% Adjusted-CLT UCL (Chen-1995)	5.312	97.5% Chebyshev (MVUE) UCL	9.218
95% Modified-t UCL (Johnson-1978)	5.278	99% Chebyshev (MVUE) UCL	11.56

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.018	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.194		
MLE of Mean	4.797		
MLE of Standard Deviation	2.393		
nu star	289.3		
Approximate Chi Square Value (.05)	250.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	5.257
Adjusted Chi Square Value	249.3	95% Jackknife UCL	5.27
		95% Standard Bootstrap UCL	5.253
Anderson-Darling Test Statistic	10.2	95% Bootstrap-t UCL	5.334
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	5.711
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	5.285
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	5.285
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.017
		97.5% Chebyshev(Mean, Sd) UCL	6.546
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.583
95% Approximate Gamma UCL	5.531		
95% Adjusted Gamma UCL	5.567		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.017

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.47	Minimum of Log Data	-0.755
Maximum	20	Maximum of Log Data	2.996
Mean	6.747	Mean of log Data	1.524
Median	6.299	SD of log Data	0.988
SD	5.82		
Coefficient of Variation	0.863		
Skewness	1.535		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.697	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.386	95% H-UCL	11.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.41
95% Adjusted-CLT UCL (Chen-1995)	8.608	97.5% Chebyshev (MVUE) UCL	16.04
95% Modified-t UCL (Johnson-1978)	8.427	99% Chebyshev (MVUE) UCL	21.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.339	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.037		
MLE of Mean	6.747		
MLE of Standard Deviation	5.83		
nu star	96.44		
Approximate Chi Square Value (.05)	74.79	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	8.343
Adjusted Chi Square Value	73.92	95% Jackknife UCL	8.386
		95% Standard Bootstrap UCL	8.322
Anderson-Darling Test Statistic	2.753	95% Bootstrap-t UCL	8.925
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	8.57
Kolmogorov-Smirnov Test Statistic	0.282	95% Percentile Bootstrap UCL	8.462
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	8.574
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.98
		97.5% Chebyshev(Mean, Sd) UCL	12.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.4
95% Approximate Gamma UCL	8.701		
95% Adjusted Gamma UCL	8.802		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	10.98

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	4	Minimum of Log Data	1.386
Maximum	268	Maximum of Log Data	5.591
Mean	74.76	Mean of log Data	4.045
Median	75.3	SD of log Data	0.964
SD	45.14		
Coefficient of Variation	0.604		
Skewness	2.361		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.552	Shapiro Wilk Test Statistic	0.538
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	87.47	95% H-UCL	133.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	161.3
95% Adjusted-CLT UCL (Chen-1995)	90.29	97.5% Chebyshev (MVUE) UCL	192.5
95% Modified-t UCL (Johnson-1978)	87.96	99% Chebyshev (MVUE) UCL	253.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.862	Data do not follow a Discernable Distribution (0.05)	
Theta Star	40.15		
MLE of Mean	74.76		
MLE of Standard Deviation	54.78		
nu star	134.1		
Approximate Chi Square Value (.05)	108.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	87.13
Adjusted Chi Square Value	107.3	95% Jackknife UCL	87.47
		95% Standard Bootstrap UCL	87.27
Anderson-Darling Test Statistic	7.941	95% Bootstrap-t UCL	93.35
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	170
Kolmogorov-Smirnov Test Statistic	0.459	95% Percentile Bootstrap UCL	86.91
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	91.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	107.5
		97.5% Chebyshev(Mean, Sd) UCL	121.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	149.6
95% Approximate Gamma UCL	92.53		
95% Adjusted Gamma UCL	93.43		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	107.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.673	Minimum of Log Data	-0.396
Maximum	140	Maximum of Log Data	4.942
Mean	43.12	Mean of log Data	3.554
Median	43.71	SD of log Data	0.965
SD	19.97		
Coefficient of Variation	0.463		
Skewness	2.762		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.418	Shapiro Wilk Test Statistic	0.384
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	48.74	95% H-UCL	81.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.71
95% Adjusted-CLT UCL (Chen-1995)	50.23	97.5% Chebyshev (MVUE) UCL	117.8
95% Modified-t UCL (Johnson-1978)	48.99	99% Chebyshev (MVUE) UCL	155.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.342	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.41		
MLE of Mean	43.12		
MLE of Standard Deviation	28.17		
nu star	168.7		
Approximate Chi Square Value (.05)	139.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	48.59
Adjusted Chi Square Value	138.4	95% Jackknife UCL	48.74
		95% Standard Bootstrap UCL	48.43
Anderson-Darling Test Statistic	10.42	95% Bootstrap-t UCL	50.14
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	79.53
Kolmogorov-Smirnov Test Statistic	0.509	95% Percentile Bootstrap UCL	49.06
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	50.55
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	57.63
		97.5% Chebyshev(Mean, Sd) UCL	63.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	76.24
95% Approximate Gamma UCL	52.08		
95% Adjusted Gamma UCL	52.53		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	57.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.076	Minimum of Log Data	-2.577
Maximum	4.7	Maximum of Log Data	1.548
Mean	1.591	Mean of log Data	0.337
Median	1.611	SD of log Data	0.668
SD	0.648		
Coefficient of Variation	0.407		
Skewness	2.577		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.422	Shapiro Wilk Test Statistic	0.401
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.773	95% H-UCL	2.208
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.65
95% Adjusted-CLT UCL (Chen-1995)	1.818	97.5% Chebyshev (MVUE) UCL	3.045
95% Modified-t UCL (Johnson-1978)	1.781	99% Chebyshev (MVUE) UCL	3.82

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.781	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.421		
MLE of Mean	1.591		
MLE of Standard Deviation	0.818		
nu star	272.3		
Approximate Chi Square Value (.05)	235.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.768
Adjusted Chi Square Value	233.5	95% Jackknife UCL	1.773
		95% Standard Bootstrap UCL	1.772
Anderson-Darling Test Statistic	10.17	95% Bootstrap-t UCL	1.815
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	2.794
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	1.782
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	1.828
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.061
		97.5% Chebyshev(Mean, Sd) UCL	2.265
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.665
95% Approximate Gamma UCL	1.843		
95% Adjusted Gamma UCL	1.855		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	2.061

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.87	Minimum of Log Data	-0.139
Maximum	150	Maximum of Log Data	5.011
Mean	48.9	Mean of log Data	3.718
Median	49.58	SD of log Data	0.849
SD	21.03		
Coefficient of Variation	0.43		
Skewness	2.606		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.423	Shapiro Wilk Test Statistic	0.384
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.82	95% H-UCL	81.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.6
95% Adjusted-CLT UCL (Chen-1995)	56.29	97.5% Chebyshev (MVUE) UCL	116.1
95% Modified-t UCL (Johnson-1978)	55.08	99% Chebyshev (MVUE) UCL	150.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.83	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.28		
MLE of Mean	48.9		
MLE of Standard Deviation	29.07		
nu star	203.8		
Approximate Chi Square Value (.05)	171.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	54.67
Adjusted Chi Square Value	170.4	95% Jackknife UCL	54.82
		95% Standard Bootstrap UCL	54.7
Anderson-Darling Test Statistic	10.3	95% Bootstrap-t UCL	56.02
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	87.41
Kolmogorov-Smirnov Test Statistic	0.502	95% Percentile Bootstrap UCL	55.02
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	57.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	64.18
		97.5% Chebyshev(Mean, Sd) UCL	70.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	83.78
95% Approximate Gamma UCL	58.02		
95% Adjusted Gamma UCL	58.47		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	64.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	165-01.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Antimony

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	2.2	Minimum of Log Data	0.788
Maximum	10	Maximum of Log Data	2.303
Mean	8.274	Mean of log Data	2.096
Median	8.36	SD of log Data	0.228
SD	1.101		
Coefficient of Variation	0.133		
Skewness	-4.88		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.302	Shapiro Wilk Test Statistic	0.241
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.585	95% H-UCL	8.925
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.731
95% Adjusted-CLT UCL (Chen-1995)	8.417	97.5% Chebyshev (MVUE) UCL	10.33
95% Modified-t UCL (Johnson-1978)	8.56	99% Chebyshev (MVUE) UCL	11.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.312		
MLE of Mean	8.274		
MLE of Standard Deviation	1.607		
nu star	1908		
Approximate Chi Square Value (.05)	1808	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	8.576
Adjusted Chi Square Value	1803	95% Jackknife UCL	8.585
		95% Standard Bootstrap UCL	8.577
Anderson-Darling Test Statistic	11.57	95% Bootstrap-t UCL	8.485
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	8.464
Kolmogorov-Smirnov Test Statistic	0.519	95% Percentile Bootstrap UCL	8.526
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	8.486
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.074
		97.5% Chebyshev(Mean, Sd) UCL	9.421
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.1
95% Approximate Gamma UCL	8.734		
95% Adjusted Gamma UCL	8.756		

Potential UCL to Use		
	Use 95% Student's-t UCL	8.585
	or 95% Modified-t UCL	8.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	2.1	Minimum of Log Data	0.742
Maximum	130.4	Maximum of Log Data	4.87
Mean	50.24	Mean of log Data	3.808
Median	50.31	SD of log Data	0.624
SD	18.25		
Coefficient of Variation	0.363		
Skewness	1.747		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.508	Shapiro Wilk Test Statistic	0.421
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	55.38	95% H-UCL	67.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	80.78
95% Adjusted-CLT UCL (Chen-1995)	56.19	97.5% Chebyshev (MVUE) UCL	92.2
95% Modified-t UCL (Johnson-1978)	55.53	99% Chebyshev (MVUE) UCL	114.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.388	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.45		
MLE of Mean	50.24		
MLE of Standard Deviation	23.99		
nu star	315.9		
Approximate Chi Square Value (.05)	275.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	55.25
Adjusted Chi Square Value	274	95% Jackknife UCL	55.38
		95% Standard Bootstrap UCL	55.14
Anderson-Darling Test Statistic	9.168	95% Bootstrap-t UCL	56.28
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	63.67
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	55.55
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	56.03
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	63.5
		97.5% Chebyshev(Mean, Sd) UCL	69.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	80.5
95% Approximate Gamma UCL	57.56		
95% Adjusted Gamma UCL	57.92		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	63.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	1140	Maximum of Log Data	7.039
Mean	464.2	Mean of log Data	5.886
Median	456.2	SD of log Data	1.434
SD	165.4		
Coefficient of Variation	0.356		
Skewness	1.284		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.503	Shapiro Wilk Test Statistic	0.28
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	510.7	95% H-UCL	2045
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2219
95% Adjusted-CLT UCL (Chen-1995)	515.8	97.5% Chebyshev (MVUE) UCL	2767
95% Modified-t UCL (Johnson-1978)	511.7	99% Chebyshev (MVUE) UCL	3842

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.963	Data do not follow a Discernable Distribution (0.05)	
Theta Star	236.4		
MLE of Mean	464.2		
MLE of Standard Deviation	331.3		
nu star	141.4		
Approximate Chi Square Value (.05)	114.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	509.5
Adjusted Chi Square Value	113.8	95% Jackknife UCL	510.7
		95% Standard Bootstrap UCL	508
Anderson-Darling Test Statistic	10.4	95% Bootstrap-t UCL	518.6
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	574.2
Kolmogorov-Smirnov Test Statistic	0.526	95% Percentile Bootstrap UCL	510.4
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	516.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	584.3
		97.5% Chebyshev(Mean, Sd) UCL	636.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	738.4
95% Approximate Gamma UCL	571.1		
95% Adjusted Gamma UCL	576.6		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	584.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	1.08	Maximum of Log Data	0.077
Mean	0.649	Mean of log Data	-0.464
Median	0.656	SD of log Data	0.314
SD	0.119		
Coefficient of Variation	0.184		
Skewness	-1.409		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.383	Shapiro Wilk Test Statistic	0.292
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.682	95% H-UCL	0.726
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.813
95% Adjusted-CLT UCL (Chen-1995)	0.677	97.5% Chebyshev (MVUE) UCL	0.879
95% Modified-t UCL (Johnson-1978)	0.682	99% Chebyshev (MVUE) UCL	1.009

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.77	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0439		
MLE of Mean	0.649		
MLE of Standard Deviation	0.169		
nu star	1064		
Approximate Chi Square Value (.05)	988.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.682
Adjusted Chi Square Value	985.6	95% Jackknife UCL	0.682
		95% Standard Bootstrap UCL	0.681
Anderson-Darling Test Statistic	11.09	95% Bootstrap-t UCL	0.677
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	0.683
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	0.68
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.676
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.736
		97.5% Chebyshev(Mean, Sd) UCL	0.773
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.847
95% Approximate Gamma UCL	0.698		
95% Adjusted Gamma UCL	0.7		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.682
	or 95% Modified-t UCL	0.682

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.0145	Log Statistics Not Avaliable
Maximum	8.65	
Mean	2.661	
Median	2.576	
SD	1.115	
Coefficient of Variation	0.419	
Skewness	4.263	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.306	Not Available	
Shapiro Wilk Critical Value	0.935		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.975	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	2.975	95% Adjusted-CLT UCL (Chen 1995)	3.107
		95% Modified-t UCL (Johnson-1978)	2.997

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	3.471	95% CLT UCL	2.966
		95% Jackknife UCL	2.975
		95% Standard Bootstrap UCL	2.961
		95% Bootstrap-t UCL	4.112
		95% Hall's Bootstrap UCL	5.93
		95% Percentile Bootstrap UCL	2.998
		95% BCA Bootstrap UCL	3.07
		95% Chebyshev(Mean, Sd) UCL	3.471
		97.5% Chebyshev(Mean, Sd) UCL	3.822
		99% Chebyshev(Mean, Sd) UCL	4.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.22	Minimum of Log Data	-1.514
Maximum	66.62	Maximum of Log Data	4.199
Mean	31.24	Mean of log Data	3.315
Median	31.77	SD of log Data	0.847
SD	8.455		
Coefficient of Variation	0.271		
Skewness	0.501		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.265
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	33.62	95% H-UCL	54.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.73
95% Adjusted-CLT UCL (Chen-1995)	33.68	97.5% Chebyshev (MVUE) UCL	77.34
95% Modified-t UCL (Johnson-1978)	33.64	99% Chebyshev (MVUE) UCL	100.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.777	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.271		
MLE of Mean	31.24		
MLE of Standard Deviation	16.07		
nu star	271.9		
Approximate Chi Square Value (.05)	234.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	33.56
Adjusted Chi Square Value	233.2	95% Jackknife UCL	33.62
		95% Standard Bootstrap UCL	33.6
Anderson-Darling Test Statistic	10.84	95% Bootstrap-t UCL	33.54
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	34.68
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	33.59
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	33.71
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	37.38
		97.5% Chebyshev(Mean, Sd) UCL	40.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	45.26
95% Approximate Gamma UCL	36.19		
95% Adjusted Gamma UCL	36.43		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	37.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	0.9	Maximum of Log Data	-0.105
Mean	0.347	Mean of log Data	-1.105
Median	0.352	SD of log Data	0.315
SD	0.113		
Coefficient of Variation	0.325		
Skewness	3.004		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.45	Shapiro Wilk Test Statistic	0.527
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.378	95% H-UCL	0.383
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.429
95% Adjusted-CLT UCL (Chen-1995)	0.388	97.5% Chebyshev (MVUE) UCL	0.464
95% Modified-t UCL (Johnson-1978)	0.38	99% Chebyshev (MVUE) UCL	0.532

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.26	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0338		
MLE of Mean	0.347		
MLE of Standard Deviation	0.108		
nu star	738.5		
Approximate Chi Square Value (.05)	676.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.378
Adjusted Chi Square Value	673.8	95% Jackknife UCL	0.378
		95% Standard Bootstrap UCL	0.377
Anderson-Darling Test Statistic	8.854	95% Bootstrap-t UCL	0.387
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.544
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	0.38
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.388
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.429
		97.5% Chebyshev(Mean, Sd) UCL	0.464
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.534
95% Approximate Gamma UCL	0.378		
95% Adjusted Gamma UCL	0.38		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.378
	or 95% Modified-t UCL	0.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.37	Minimum of Log Data	-0.994
Maximum	4.7	Maximum of Log Data	1.548
Mean	1.435	Mean of log Data	0.29
Median	1.417	SD of log Data	0.396
SD	0.626		
Coefficient of Variation	0.436		
Skewness	3.938		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.397	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.611	95% H-UCL	1.634
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.869
95% Adjusted-CLT UCL (Chen-1995)	1.68	97.5% Chebyshev (MVUE) UCL	2.054
95% Modified-t UCL (Johnson-1978)	1.623	99% Chebyshev (MVUE) UCL	2.417

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.564	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.219		
MLE of Mean	1.435		
MLE of Standard Deviation	0.56		
nu star	472.6		
Approximate Chi Square Value (.05)	423.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.607
Adjusted Chi Square Value	421.1	95% Jackknife UCL	1.611
		95% Standard Bootstrap UCL	1.608
Anderson-Darling Test Statistic	9.277	95% Bootstrap-t UCL	1.696
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	2.438
Kolmogorov-Smirnov Test Statistic	0.453	95% Percentile Bootstrap UCL	1.611
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	1.706
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.89
		97.5% Chebyshev(Mean, Sd) UCL	2.086
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.473
95% Approximate Gamma UCL	1.603		
95% Adjusted Gamma UCL	1.611		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.611
	or 95% Modified-t UCL	1.623

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	0.56	Maximum of Log Data	-0.58
Mean	0.407	Mean of log Data	-0.932
Median	0.411	SD of log Data	0.33
SD	0.068		
Coefficient of Variation	0.167		
Skewness	-3.518		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.395	Shapiro Wilk Test Statistic	0.274
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.426	95% H-UCL	0.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.517
95% Adjusted-CLT UCL (Chen-1995)	0.418	97.5% Chebyshev (MVUE) UCL	0.561
95% Modified-t UCL (Johnson-1978)	0.425	99% Chebyshev (MVUE) UCL	0.648

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0284		
MLE of Mean	0.407		
MLE of Standard Deviation	0.108		
nu star	1030		
Approximate Chi Square Value (.05)	956.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	0.425
Adjusted Chi Square Value	953.5	95% Jackknife UCL	0.426
		95% Standard Bootstrap UCL	0.425
Anderson-Darling Test Statistic	10.67	95% Bootstrap-t UCL	0.421
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	0.421
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	0.424
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	0.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.456
		97.5% Chebyshev(Mean, Sd) UCL	0.478
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.52
95% Approximate Gamma UCL	0.438		
95% Adjusted Gamma UCL	0.44		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.426
	or 95% Modified-t UCL	0.425

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.44	Minimum of Log Data	-0.821
Maximum	39.2	Maximum of Log Data	3.669
Mean	30.76	Mean of log Data	3.334
Median	31.25	SD of log Data	0.714
SD	5.405		
Coefficient of Variation	0.176		
Skewness	-5.209		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.302	Shapiro Wilk Test Statistic	0.199
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.28	95% H-UCL	46.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	56.15
95% Adjusted-CLT UCL (Chen-1995)	31.41	97.5% Chebyshev (MVUE) UCL	64.92
95% Modified-t UCL (Johnson-1978)	32.15	99% Chebyshev (MVUE) UCL	82.16

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.152	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.97		
MLE of Mean	30.76		
MLE of Standard Deviation	13.55		
nu star	371		
Approximate Chi Square Value (.05)	327.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	32.24
Adjusted Chi Square Value	325.5	95% Jackknife UCL	32.28
		95% Standard Bootstrap UCL	32.26
Anderson-Darling Test Statistic	12.37	95% Bootstrap-t UCL	31.82
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	31.71
Kolmogorov-Smirnov Test Statistic	0.519	95% Percentile Bootstrap UCL	31.94
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	31.72
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.69
		97.5% Chebyshev(Mean, Sd) UCL	36.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	39.72
95% Approximate Gamma UCL	34.86		
95% Adjusted Gamma UCL	35.06		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	34.69

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	51	Maximum of Log Data	3.932
Mean	3.772	Mean of log Data	0.323
Median	2	SD of log Data	1.458
SD	8.508		
Coefficient of Variation	2.256		
Skewness	5.183		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Test Statistic	0.94
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.168	95% H-UCL	8.268
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.885
95% Adjusted-CLT UCL (Chen-1995)	7.413	97.5% Chebyshev (MVUE) UCL	11.1
95% Modified-t UCL (Johnson-1978)	6.372	99% Chebyshev (MVUE) UCL	15.44

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.58	Data appear Lognormal at 5% Significance Level	
Theta Star	6.499		
MLE of Mean	3.772		
MLE of Standard Deviation	4.951		
nu star	41.79		
Approximate Chi Square Value (.05)	27.97	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	6.104
Adjusted Chi Square Value	27.46	95% Jackknife UCL	6.168
		95% Standard Bootstrap UCL	6.125
Anderson-Darling Test Statistic	1.379	95% Bootstrap-t UCL	11.87
Anderson-Darling 5% Critical Value	0.801	95% Hall's Bootstrap UCL	15.04
Kolmogorov-Smirnov Test Statistic	0.252	95% Percentile Bootstrap UCL	6.431
Kolmogorov-Smirnov 5% Critical Value	0.154	95% BCA Bootstrap UCL	8.378
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.953
		97.5% Chebyshev(Mean, Sd) UCL	12.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.88
95% Approximate Gamma UCL	5.635		
95% Adjusted Gamma UCL	5.741		

Potential UCL to Use	Use 95% H-UCL	8.268

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Plutonium-239/240

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.00963	Minimum of Log Data	-4.643
Maximum	7.78	Maximum of Log Data	2.052
Mean	2.045	Mean of log Data	0.547
Median	1.964	SD of log Data	0.926
SD	1.046		
Coefficient of Variation	0.512		
Skewness	4.729		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.307	Shapiro Wilk Test Statistic	0.282
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.339	95% H-UCL	3.804
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.614
95% Adjusted-CLT UCL (Chen-1995)	2.478	97.5% Chebyshev (MVUE) UCL	5.481
95% Modified-t UCL (Johnson-1978)	2.362	99% Chebyshev (MVUE) UCL	7.185

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.886	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.708		
MLE of Mean	2.045		
MLE of Standard Deviation	1.204		
nu star	207.8		
Approximate Chi Square Value (.05)	175.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	2.331
Adjusted Chi Square Value	174.1	95% Jackknife UCL	2.339
		95% Standard Bootstrap UCL	2.342
Anderson-Darling Test Statistic	11.02	95% Bootstrap-t UCL	2.676
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	4.072
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	2.368
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	2.449
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.805
		97.5% Chebyshev(Mean, Sd) UCL	3.134
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.78
95% Approximate Gamma UCL	2.422		
95% Adjusted Gamma UCL	2.44		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	2.805

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.22	Minimum of Log Data	-1.514
Maximum	83.3	Maximum of Log Data	4.422
Mean	22.21	Mean of log Data	2.897
Median	22.52	SD of log Data	0.914
SD	12		
Coefficient of Variation	0.541		
Skewness	3.549		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.424	Shapiro Wilk Test Statistic	0.435
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.59	95% H-UCL	39.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	47.53
95% Adjusted-CLT UCL (Chen-1995)	26.76	97.5% Chebyshev (MVUE) UCL	56.38
95% Modified-t UCL (Johnson-1978)	25.79	99% Chebyshev (MVUE) UCL	73.76

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.417	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.189		
MLE of Mean	22.21		
MLE of Standard Deviation	14.29		
nu star	174		
Approximate Chi Square Value (.05)	144.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	25.5
Adjusted Chi Square Value	143.3	95% Jackknife UCL	25.59
		95% Standard Bootstrap UCL	25.45
Anderson-Darling Test Statistic	9.19	95% Bootstrap-t UCL	26.87
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	42.02
Kolmogorov-Smirnov Test Statistic	0.48	95% Percentile Bootstrap UCL	25.65
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	27.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	30.93
		97.5% Chebyshev(Mean, Sd) UCL	34.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.12
95% Approximate Gamma UCL	26.74		
95% Adjusted Gamma UCL	26.97		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	30.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.22	Minimum of Log Data	-1.514
Maximum	11.4	Maximum of Log Data	2.434
Mean	4.797	Mean of log Data	1.449
Median	4.746	SD of log Data	0.665
SD	1.68		
Coefficient of Variation	0.35		
Skewness	1.096		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.38
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.27	95% H-UCL	6.688
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.027
95% Adjusted-CLT UCL (Chen-1995)	5.312	97.5% Chebyshev (MVUE) UCL	9.218
95% Modified-t UCL (Johnson-1978)	5.278	99% Chebyshev (MVUE) UCL	11.56

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.018	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.194		
MLE of Mean	4.797		
MLE of Standard Deviation	2.393		
nu star	289.3		
Approximate Chi Square Value (.05)	250.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	5.257
Adjusted Chi Square Value	249.3	95% Jackknife UCL	5.27
		95% Standard Bootstrap UCL	5.256
Anderson-Darling Test Statistic	10.2	95% Bootstrap-t UCL	5.285
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	5.84
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	5.263
Kolmogorov-Smirnov 5% Critical Value	0.147	95% BCA Bootstrap UCL	5.226
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.017
		97.5% Chebyshev(Mean, Sd) UCL	6.546
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.583
95% Approximate Gamma UCL	5.531		
95% Adjusted Gamma UCL	5.567		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.017

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	36	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.47	Minimum of Log Data	-0.755
Maximum	20	Maximum of Log Data	2.996
Mean	6.929	Mean of log Data	1.552
Median	6.626	SD of log Data	0.997
SD	5.808		
Coefficient of Variation	0.838		
Skewness	1.446		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.712	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.564	95% H-UCL	11.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.99
95% Adjusted-CLT UCL (Chen-1995)	8.77	97.5% Chebyshev (MVUE) UCL	16.76
95% Modified-t UCL (Johnson-1978)	8.603	99% Chebyshev (MVUE) UCL	22.19
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.344	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.154		
MLE of Mean	6.929		
MLE of Standard Deviation	5.976		
nu star	96.79		
Approximate Chi Square Value (.05)	75.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	8.521
Adjusted Chi Square Value	74.23	95% Jackknife UCL	8.564
		95% Standard Bootstrap UCL	8.534
Anderson-Darling Test Statistic	2.742	95% Bootstrap-t UCL	8.96
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	8.744
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	8.558
Kolmogorov-Smirnov 5% Critical Value	0.15	95% BCA Bootstrap UCL	8.718
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.15
		97.5% Chebyshev(Mean, Sd) UCL	12.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.56
95% Approximate Gamma UCL	8.931		
95% Adjusted Gamma UCL	9.035		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	4	Minimum of Log Data	1.386
Maximum	268	Maximum of Log Data	5.591
Mean	74.76	Mean of log Data	4.045
Median	75.3	SD of log Data	0.964
SD	45.14		
Coefficient of Variation	0.604		
Skewness	2.361		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.552	Shapiro Wilk Test Statistic	0.538
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	87.47	95% H-UCL	133.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	161.3
95% Adjusted-CLT UCL (Chen-1995)	90.29	97.5% Chebyshev (MVUE) UCL	192.5
95% Modified-t UCL (Johnson-1978)	87.96	99% Chebyshev (MVUE) UCL	253.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.862	Data do not follow a Discernable Distribution (0.05)	
Theta Star	40.15		
MLE of Mean	74.76		
MLE of Standard Deviation	54.78		
nu star	134.1		
Approximate Chi Square Value (.05)	108.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	87.13
Adjusted Chi Square Value	107.3	95% Jackknife UCL	87.47
		95% Standard Bootstrap UCL	86.66
Anderson-Darling Test Statistic	7.941	95% Bootstrap-t UCL	93
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	164.4
Kolmogorov-Smirnov Test Statistic	0.459	95% Percentile Bootstrap UCL	87.38
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	91.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	107.5
		97.5% Chebyshev(Mean, Sd) UCL	121.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	149.6
95% Approximate Gamma UCL	92.53		
95% Adjusted Gamma UCL	93.43		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	107.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	140	Maximum of Log Data	4.942
Mean	43.01	Mean of log Data	3.454
Median	43.62	SD of log Data	1.437
SD	20.01		
Coefficient of Variation	0.465		
Skewness	2.749		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.341
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	48.65	95% H-UCL	180.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	196.1
95% Adjusted-CLT UCL (Chen-1995)	50.13	97.5% Chebyshev (MVUE) UCL	244.5
95% Modified-t UCL (Johnson-1978)	48.9	99% Chebyshev (MVUE) UCL	339.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.646	Data do not follow a Discernable Distribution (0.05)	
Theta Star	26.13		
MLE of Mean	43.01		
MLE of Standard Deviation	33.52		
nu star	118.5		
Approximate Chi Square Value (.05)	94.41	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	48.5
Adjusted Chi Square Value	93.43	95% Jackknife UCL	48.65
		95% Standard Bootstrap UCL	48.48
Anderson-Darling Test Statistic	10.64	95% Bootstrap-t UCL	49.96
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	79.36
Kolmogorov-Smirnov Test Statistic	0.523	95% Percentile Bootstrap UCL	48.97
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	50.44
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	57.55
		97.5% Chebyshev(Mean, Sd) UCL	63.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	76.2
95% Approximate Gamma UCL	54.01		
95% Adjusted Gamma UCL	54.58		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	57.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.01	Minimum of Log Data	-4.605
Maximum	4.7	Maximum of Log Data	1.548
Mean	1.567	Mean of log Data	0.249
Median	1.589	SD of log Data	0.999
SD	0.657		
Coefficient of Variation	0.419		
Skewness	2.473		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.424	Shapiro Wilk Test Statistic	0.356
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.752	95% H-UCL	3.159
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.814
95% Adjusted-CLT UCL (Chen-1995)	1.796	97.5% Chebyshev (MVUE) UCL	4.568
95% Modified-t UCL (Johnson-1978)	1.76	99% Chebyshev (MVUE) UCL	6.05

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.441	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.642		
MLE of Mean	1.567		
MLE of Standard Deviation	1.003		
nu star	175.8		
Approximate Chi Square Value (.05)	146.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	1.748
Adjusted Chi Square Value	144.9	95% Jackknife UCL	1.752
		95% Standard Bootstrap UCL	1.748
Anderson-Darling Test Statistic	10.5	95% Bootstrap-t UCL	1.784
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	2.76
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	1.762
Kolmogorov-Smirnov 5% Critical Value	0.148	95% BCA Bootstrap UCL	1.804
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.045
		97.5% Chebyshev(Mean, Sd) UCL	2.251
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.657
95% Approximate Gamma UCL	1.886		
95% Adjusted Gamma UCL	1.902		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.045

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	36	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	150	Maximum of Log Data	5.011
Mean	48.77	Mean of log Data	3.622
Median	49.46	SD of log Data	1.333
SD	21.09		
Coefficient of Variation	0.432		
Skewness	2.587		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.423	Shapiro Wilk Test Statistic	0.323
Shapiro Wilk Critical Value	0.935	Shapiro Wilk Critical Value	0.935
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.71	95% H-UCL	170.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	192.2
95% Adjusted-CLT UCL (Chen-1995)	56.17	97.5% Chebyshev (MVUE) UCL	237.7
95% Modified-t UCL (Johnson-1978)	54.96	99% Chebyshev (MVUE) UCL	327

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.888	Data do not follow a Discernable Distribution (0.05)	
Theta Star	25.84		
MLE of Mean	48.77		
MLE of Standard Deviation	35.5		
nu star	135.9		
Approximate Chi Square Value (.05)	110	Nonparametric Statistics	
Adjusted Level of Significance	0.0428	95% CLT UCL	54.55
Adjusted Chi Square Value	108.9	95% Jackknife UCL	54.71
		95% Standard Bootstrap UCL	54.59
Anderson-Darling Test Statistic	10.58	95% Bootstrap-t UCL	55.89
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	87.35
Kolmogorov-Smirnov Test Statistic	0.517	95% Percentile Bootstrap UCL	54.84
Kolmogorov-Smirnov 5% Critical Value	0.149	95% BCA Bootstrap UCL	57.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	64.09
		97.5% Chebyshev(Mean, Sd) UCL	70.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	83.73
95% Approximate Gamma UCL	60.27		
95% Adjusted Gamma UCL	60.86		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	64.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	158-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.25	Minimum of Log Data	-1.386
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.46	Mean of log Data	-0.794
Median	0.46	SD of log Data	0.201
SD	0.0849		
Coefficient of Variation	0.184		
Skewness	-0.0886		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk Test Statistic	0.726
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.49	95% H-UCL	0.497
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.544
95% Adjusted-CLT UCL (Chen-1995)	0.489	97.5% Chebyshev (MVUE) UCL	0.58
95% Modified-t UCL (Johnson-1978)	0.49	99% Chebyshev (MVUE) UCL	0.651

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	24.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0189		
MLE of Mean	0.46		
MLE of Standard Deviation	0.0932		
nu star	1170		
Approximate Chi Square Value (.05)	1092	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.489
Adjusted Chi Square Value	1086	95% Jackknife UCL	0.49
		95% Standard Bootstrap UCL	0.489
Anderson-Darling Test Statistic	3.278	95% Bootstrap-t UCL	0.49
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.494
Kolmogorov-Smirnov Test Statistic	0.4	95% Percentile Bootstrap UCL	0.487
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	0.487
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.536
		97.5% Chebyshev(Mean, Sd) UCL	0.569
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.633
95% Approximate Gamma UCL	0.493		
95% Adjusted Gamma UCL	0.496		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.49
	or 95% Modified-t UCL	0.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	3.33	Minimum of Log Data	1.203
Maximum	12.83	Maximum of Log Data	2.552
Mean	8.756	Mean of log Data	2.135
Median	8.756	SD of log Data	0.288
SD	2.166		
Coefficient of Variation	0.247		
Skewness	-0.327		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.845
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.514	95% H-UCL	9.831
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.09
95% Adjusted-CLT UCL (Chen-1995)	9.452	97.5% Chebyshev (MVUE) UCL	12.08
95% Modified-t UCL (Johnson-1978)	9.509	99% Chebyshev (MVUE) UCL	14.02

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.57	Data appear Normal at 5% Significance Level	
Theta Star	0.697		
MLE of Mean	8.756		
MLE of Standard Deviation	2.47		
nu star	603.4		
Approximate Chi Square Value (.05)	547.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	9.484
Adjusted Chi Square Value	543.7	95% Jackknife UCL	9.514
		95% Standard Bootstrap UCL	9.476
Anderson-Darling Test Statistic	1.262	95% Bootstrap-t UCL	9.488
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	9.508
Kolmogorov-Smirnov Test Statistic	0.243	95% Percentile Bootstrap UCL	9.42
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	9.413
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.68
		97.5% Chebyshev(Mean, Sd) UCL	11.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.16
95% Approximate Gamma UCL	9.652		
95% Adjusted Gamma UCL	9.718		

Potential UCL to Use		Use 95% Student's-t UCL	9.514

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	30.6	Minimum of Log Data	3.421
Maximum	292	Maximum of Log Data	5.677
Mean	146.8	Mean of log Data	4.921
Median	146.8	SD of log Data	0.417
SD	49.95		
Coefficient of Variation	0.34		
Skewness	0.842		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.694	Shapiro Wilk Test Statistic	0.647
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	164.3	95% H-UCL	176.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	206
95% Adjusted-CLT UCL (Chen-1995)	165.5	97.5% Chebyshev (MVUE) UCL	230.7
95% Modified-t UCL (Johnson-1978)	164.6	99% Chebyshev (MVUE) UCL	279.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.625	Data do not follow a Discernable Distribution (0.05)	
Theta Star	22.16		
MLE of Mean	146.8		
MLE of Standard Deviation	57.04		
nu star	318		
Approximate Chi Square Value (.05)	277.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	163.6
Adjusted Chi Square Value	275	95% Jackknife UCL	164.3
		95% Standard Bootstrap UCL	163.5
Anderson-Darling Test Statistic	3.865	95% Bootstrap-t UCL	166.9
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	180.9
Kolmogorov-Smirnov Test Statistic	0.382	95% Percentile Bootstrap UCL	163.3
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	163.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	191.3
		97.5% Chebyshev(Mean, Sd) UCL	210.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	248.3
95% Approximate Gamma UCL	168.1		
95% Adjusted Gamma UCL	169.8		

Potential UCL to Use		
	Use 95% Student's-t UCL	164.3
	or 95% Modified-t UCL	164.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.33	Minimum of Log Data	-1.109
Maximum	0.75	Maximum of Log Data	-0.288
Mean	0.545	Mean of log Data	-0.616
Median	0.545	SD of log Data	0.136
SD	0.0693		
Coefficient of Variation	0.127		
Skewness	-0.144		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.713	Shapiro Wilk Test Statistic	0.678
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.569	95% H-UCL	0.573
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.611
95% Adjusted-CLT UCL (Chen-1995)	0.567	97.5% Chebyshev (MVUE) UCL	0.64
95% Modified-t UCL (Johnson-1978)	0.569	99% Chebyshev (MVUE) UCL	0.696

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	52.22	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0104		
MLE of Mean	0.545		
MLE of Standard Deviation	0.0754		
nu star	2507		
Approximate Chi Square Value (.05)	2391	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.568
Adjusted Chi Square Value	2383	95% Jackknife UCL	0.569
		95% Standard Bootstrap UCL	0.567
Anderson-Darling Test Statistic	3.453	95% Bootstrap-t UCL	0.567
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.574
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	0.567
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	0.567
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.606
		97.5% Chebyshev(Mean, Sd) UCL	0.633
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.685
95% Approximate Gamma UCL	0.571		
95% Adjusted Gamma UCL	0.573		

Potential UCL to Use		Use 95% Student's-t UCL	0.569
		or 95% Modified-t UCL	0.569

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	22.1	Minimum of Log Data	3.096
Maximum	85	Maximum of Log Data	4.443
Mean	46.77	Mean of log Data	3.813
Median	46.77	SD of log Data	0.261
SD	12.51		
Coefficient of Variation	0.267		
Skewness	1.267		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	51.14	95% H-UCL	51.66
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	57.75
95% Adjusted-CLT UCL (Chen-1995)	51.67	97.5% Chebyshev (MVUE) UCL	62.5
95% Modified-t UCL (Johnson-1978)	51.25	99% Chebyshev (MVUE) UCL	71.82

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.69	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.417		
MLE of Mean	46.77		
MLE of Standard Deviation	12.64		
nu star	657		
Approximate Chi Square Value (.05)	598.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	50.97
Adjusted Chi Square Value	594.6	95% Jackknife UCL	51.14
		95% Standard Bootstrap UCL	50.88
Anderson-Darling Test Statistic	1.474	95% Bootstrap-t UCL	52.23
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	55.08
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	51.04
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	51.87
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	57.9
		97.5% Chebyshev(Mean, Sd) UCL	62.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	72.17
95% Approximate Gamma UCL	51.34		
95% Adjusted Gamma UCL	51.68		

Potential UCL to Use		
	Use 95% Student's-t UCL	51.14
	or 95% Modified-t UCL	51.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	3.1	Minimum of Log Data	1.131
Maximum	36.5	Maximum of Log Data	3.597
Mean	10.49	Mean of log Data	2.258
Median	10.49	SD of log Data	0.413
SD	5.913		
Coefficient of Variation	0.564		
Skewness	3.878		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.466	Shapiro Wilk Test Statistic	0.684
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.55	95% H-UCL	12.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.29
95% Adjusted-CLT UCL (Chen-1995)	13.49	97.5% Chebyshev (MVUE) UCL	15.98
95% Modified-t UCL (Johnson-1978)	12.71	99% Chebyshev (MVUE) UCL	19.31

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.93	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.127		
MLE of Mean	10.49		
MLE of Standard Deviation	4.722		
nu star	236.6		
Approximate Chi Square Value (.05)	202	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	12.47
Adjusted Chi Square Value	199.8	95% Jackknife UCL	12.55
		95% Standard Bootstrap UCL	12.42
Anderson-Darling Test Statistic	3.766	95% Bootstrap-t UCL	14.49
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	21.26
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	12.67
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	14.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.75
		97.5% Chebyshev(Mean, Sd) UCL	18.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.49
95% Approximate Gamma UCL	12.28		
95% Adjusted Gamma UCL	12.42		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.55
	or 95% Modified-t UCL	12.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	36.4	Minimum of Log Data	3.595
Maximum	1860	Maximum of Log Data	7.528
Mean	720.3	Mean of log Data	6.361
Median	720.3	SD of log Data	0.86
SD	363.7		
Coefficient of Variation	0.505		
Skewness	0.811		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.85	Shapiro Wilk Test Statistic	0.691
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	847.6	95% H-UCL	1280
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1516
95% Adjusted-CLT UCL (Chen-1995)	855.6	97.5% Chebyshev (MVUE) UCL	1816
95% Modified-t UCL (Johnson-1978)	849.6	99% Chebyshev (MVUE) UCL	2407

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.163	Data do not follow a Discernable Distribution (0.05)	
Theta Star	333		
MLE of Mean	720.3		
MLE of Standard Deviation	489.8		
nu star	103.8		
Approximate Chi Square Value (.05)	81.31	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	842.4
Adjusted Chi Square Value	79.91	95% Jackknife UCL	847.6
		95% Standard Bootstrap UCL	840.4
Anderson-Darling Test Statistic	2.505	95% Bootstrap-t UCL	858.6
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	898
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	846
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	853.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1044
		97.5% Chebyshev(Mean, Sd) UCL	1184
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1459
95% Approximate Gamma UCL	919.8		
95% Adjusted Gamma UCL	935.9		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1044

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.0078	Minimum of Log Data	-4.854
Maximum	10.46	Maximum of Log Data	2.348
Mean	4.156	Mean of log Data	-0.0532
Median	4.156	SD of log Data	2.649
SD	3.749		
Coefficient of Variation	0.902		
Skewness	0.472		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.824	Shapiro Wilk Test Statistic	0.749
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.468	95% H-UCL	562
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	78.15
95% Adjusted-CLT UCL (Chen-1995)	5.494	97.5% Chebyshev (MVUE) UCL	103.6
95% Modified-t UCL (Johnson-1978)	5.48	99% Chebyshev (MVUE) UCL	153.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.412	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.1		
MLE of Mean	4.156		
MLE of Standard Deviation	6.478		
nu star	19.76		
Approximate Chi Square Value (.05)	10.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	5.415
Adjusted Chi Square Value	10.21	95% Jackknife UCL	5.468
		95% Standard Bootstrap UCL	5.377
Anderson-Darling Test Statistic	2.544	95% Bootstrap-t UCL	5.529
Anderson-Darling 5% Critical Value	0.82	95% Hall's Bootstrap UCL	5.511
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	5.368
Kolmogorov-Smirnov 5% Critical Value	0.19	95% BCA Bootstrap UCL	5.456
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.492
		97.5% Chebyshev(Mean, Sd) UCL	8.935
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.77
95% Approximate Gamma UCL	7.694		
95% Adjusted Gamma UCL	8.047		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	11.77

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics
Minimum	0	Log Statistics Not Avaliable
Maximum	0.089	
Mean	0.0443	
Median	0.0443	
SD	0.0172	
Coefficient of Variation	0.389	
Skewness	0.00604	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.59	Not Available	
Shapiro Wilk Critical Value	0.916		
Data not Normal at 5% Significance Level			

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0503	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0503	95% Adjusted-CLT UCL (Chen 199	0.0501
		95% Modified-t UCL (Johnson-197	0.0503

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0596	95% CLT UCL	0.0501
		95% Jackknife UCL	0.0503
		95% Standard Bootstrap UCL	0.0501
		95% Bootstrap-t UCL	0.0504
		95% Hall's Bootstrap UCL	0.0521
		95% Percentile Bootstrap UCL	0.0496
		95% BCA Bootstrap UCL	0.0496
		95% Chebyshev(Mean, Sd) UCL	0.0596
		97.5% Chebyshev(Mean, Sd) UCL	0.0663
		99% Chebyshev(Mean, Sd) UCL	0.0793

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	4.2	Minimum of Log Data	1.435
Maximum	131.9	Maximum of Log Data	4.882
Mean	55.33	Mean of log Data	3.767
Median	55.33	SD of log Data	0.887
SD	29.09		
Coefficient of Variation	0.526		
Skewness	0.188		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.883	Shapiro Wilk Test Statistic	0.735
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.51	95% H-UCL	99.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	117.6
95% Adjusted-CLT UCL (Chen-1995)	65.34	97.5% Chebyshev (MVUE) UCL	141.4
95% Modified-t UCL (Johnson-1978)	65.54	99% Chebyshev (MVUE) UCL	188.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.937	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.57		
MLE of Mean	55.33		
MLE of Standard Deviation	39.76		
nu star	92.96		
Approximate Chi Square Value (.05)	71.72	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	65.1
Adjusted Chi Square Value	70.41	95% Jackknife UCL	65.51
		95% Standard Bootstrap UCL	64.62
Anderson-Darling Test Statistic	2.366	95% Bootstrap-t UCL	65.79
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	66.31
Kolmogorov-Smirnov Test Statistic	0.382	95% Percentile Bootstrap UCL	64.74
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	65.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.21
		97.5% Chebyshev(Mean, Sd) UCL	92.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	114.4
95% Approximate Gamma UCL	71.71		
95% Adjusted Gamma UCL	73.05		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	81.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.029	Minimum of Log Data	-3.54
Maximum	14.7	Maximum of Log Data	2.688
Mean	4.712	Mean of log Data	0.458
Median	4.712	SD of log Data	2.143
SD	4.199		
Coefficient of Variation	0.891		
Skewness	0.627		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.852	Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.181	95% H-UCL	108.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	42.1
95% Adjusted-CLT UCL (Chen-1995)	6.239	97.5% Chebyshev (MVUE) UCL	55.05
95% Modified-t UCL (Johnson-1978)	6.199	99% Chebyshev (MVUE) UCL	80.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.526	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.95		
MLE of Mean	4.712		
MLE of Standard Deviation	6.494		
nu star	25.27		
Approximate Chi Square Value (.05)	14.82	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	6.122
Adjusted Chi Square Value	14.26	95% Jackknife UCL	6.181
		95% Standard Bootstrap UCL	6.105
Anderson-Darling Test Statistic	1.958	95% Bootstrap-t UCL	6.48
Anderson-Darling 5% Critical Value	0.8	95% Hall's Bootstrap UCL	6.245
Kolmogorov-Smirnov Test Statistic	0.339	95% Percentile Bootstrap UCL	6.097
Kolmogorov-Smirnov 5% Critical Value	0.187	95% BCA Bootstrap UCL	6.182
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.448
		97.5% Chebyshev(Mean, Sd) UCL	10.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.24
95% Approximate Gamma UCL	8.035		
95% Adjusted Gamma UCL	8.352		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UC	10.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.17	Minimum of Log Data	-1.772
Maximum	0.534	Maximum of Log Data	-0.627
Mean	0.341	Mean of log Data	-1.105
Median	0.341	SD of log Data	0.255
SD	0.0808		
Coefficient of Variation	0.237		
Skewness	0.383		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.745	Shapiro Wilk Test Statistic	0.73
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.369	95% H-UCL	0.376
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.42
95% Adjusted-CLT UCL (Chen-1995)	0.37	97.5% Chebyshev (MVUE) UCL	0.454
95% Modified-t UCL (Johnson-1978)	0.369	99% Chebyshev (MVUE) UCL	0.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.23	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0224		
MLE of Mean	0.341		
MLE of Standard Deviation	0.0874		
nu star	731.1		
Approximate Chi Square Value (.05)	669.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.368
Adjusted Chi Square Value	665.2	95% Jackknife UCL	0.369
		95% Standard Bootstrap UCL	0.367
Anderson-Darling Test Statistic	3.287	95% Bootstrap-t UCL	0.371
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.381
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	0.369
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	0.367
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.413
		97.5% Chebyshev(Mean, Sd) UCL	0.444
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.505
95% Approximate Gamma UCL	0.372		
95% Adjusted Gamma UCL	0.375		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.369
	or 95% Modified-t UCL	0.369

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0072	Minimum of Log Data	-4.934
Maximum	2.3	Maximum of Log Data	0.833
Mean	0.605	Mean of log Data	-0.758
Median	0.605	SD of log Data	1.016
SD	0.396		
Coefficient of Variation	0.655		
Skewness	3.421		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.483	Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.744	95% H-UCL	1.352
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.544
95% Adjusted-CLT UCL (Chen-1995)	0.799	97.5% Chebyshev (MVUE) UCL	1.883
95% Modified-t UCL (Johnson-1978)	0.753	99% Chebyshev (MVUE) UCL	2.548

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.872	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.323		
MLE of Mean	0.605		
MLE of Standard Deviation	0.442		
nu star	89.86		
Approximate Chi Square Value (.05)	69	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.738
Adjusted Chi Square Value	67.72	95% Jackknife UCL	0.744
		95% Standard Bootstrap UCL	0.735
Anderson-Darling Test Statistic	4.834	95% Bootstrap-t UCL	0.83
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	1.37
Kolmogorov-Smirnov Test Statistic	0.383	95% Percentile Bootstrap UCL	0.738
Kolmogorov-Smirnov 5% Critical Value	0.18	95% BCA Bootstrap UCL	0.806
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.958
		97.5% Chebyshev(Mean, Sd) UCL	1.111
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.41
95% Approximate Gamma UCL	0.788		
95% Adjusted Gamma UCL	0.803		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.958

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	2.9	Minimum of Log Data	1.065
Maximum	30.24	Maximum of Log Data	3.409
Mean	15.52	Mean of log Data	2.652
Median	15.52	SD of log Data	0.506
SD	5.365		
Coefficient of Variation	0.346		
Skewness	-0.128		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.676
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.4	95% H-UCL	19.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23.54
95% Adjusted-CLT UCL (Chen-1995)	17.29	97.5% Chebyshev (MVUE) UCL	26.79
95% Modified-t UCL (Johnson-1978)	17.39	99% Chebyshev (MVUE) UCL	33.17

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.041	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.079		
MLE of Mean	15.52		
MLE of Standard Deviation	6.914		
nu star	242		
Approximate Chi Square Value (.05)	207	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	17.32
Adjusted Chi Square Value	204.7	95% Jackknife UCL	17.4
		95% Standard Bootstrap UCL	17.31
Anderson-Darling Test Statistic	2.704	95% Bootstrap-t UCL	17.33
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	17.57
Kolmogorov-Smirnov Test Statistic	0.347	95% Percentile Bootstrap UCL	17.32
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	17.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.3
		97.5% Chebyshev(Mean, Sd) UCL	22.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.42
95% Approximate Gamma UCL	18.15		
95% Adjusted Gamma UCL	18.35		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	20.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.053	Minimum of Log Data	-2.937
Maximum	0.259	Maximum of Log Data	-1.351
Mean	0.128	Mean of log Data	-2.092
Median	0.128	SD of log Data	0.286
SD	0.0348		
Coefficient of Variation	0.272		
Skewness	1.67		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.504	Shapiro Wilk Test Statistic	0.521
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.14	95% H-UCL	0.143
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.162
95% Adjusted-CLT UCL (Chen-1995)	0.142	97.5% Chebyshev (MVUE) UCL	0.176
95% Modified-t UCL (Johnson-1978)	0.141	99% Chebyshev (MVUE) UCL	0.204

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0104		
MLE of Mean	0.128		
MLE of Standard Deviation	0.0365		
nu star	591.1		
Approximate Chi Square Value (.05)	535.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.14
Adjusted Chi Square Value	532	95% Jackknife UCL	0.14
		95% Standard Bootstrap UCL	0.14
Anderson-Darling Test Statistic	5.875	95% Bootstrap-t UCL	0.141
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.163
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	0.14
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	0.142
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.159
		97.5% Chebyshev(Mean, Sd) UCL	0.172
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.199
95% Approximate Gamma UCL	0.141		
95% Adjusted Gamma UCL	0.142		

Potential UCL to Use		Use 95% Student's-t UCL	0.14
		or 95% Modified-t UCL	0.141

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.79	Minimum of Log Data	-0.236
Maximum	6.5	Maximum of Log Data	1.872
Mean	2.828	Mean of log Data	0.983
Median	2.828	SD of log Data	0.37
SD	0.948		
Coefficient of Variation	0.335		
Skewness	1.995		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.476	Shapiro Wilk Test Statistic	0.498
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.159	95% H-UCL	3.307
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.813
95% Adjusted-CLT UCL (Chen-1995)	3.23	97.5% Chebyshev (MVUE) UCL	4.229
95% Modified-t UCL (Johnson-1978)	3.172	99% Chebyshev (MVUE) UCL	5.046

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.89	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.358		
MLE of Mean	2.828		
MLE of Standard Deviation	1.007		
nu star	378.7		
Approximate Chi Square Value (.05)	334.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	3.146
Adjusted Chi Square Value	331.7	95% Jackknife UCL	3.159
		95% Standard Bootstrap UCL	3.131
Anderson-Darling Test Statistic	6.156	95% Bootstrap-t UCL	3.222
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	5.002
Kolmogorov-Smirnov Test Statistic	0.461	95% Percentile Bootstrap UCL	3.202
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	3.218
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.671
		97.5% Chebyshev(Mean, Sd) UCL	4.036
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.753
95% Approximate Gamma UCL	3.2		
95% Adjusted Gamma UCL	3.228		

Potential UCL to Use		
	Use 95% Student's-t UCL	3.159
	or 95% Modified-t UCL	3.172

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	158-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.15	Minimum of Log Data	-1.897
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.493	Mean of log Data	-0.733
Median	0.493	SD of log Data	0.261
SD	0.0863		
Coefficient of Variation	0.175		
Skewness	-2.234		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.481	Shapiro Wilk Test Statistic	0.377
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.523	95% H-UCL	0.548
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.613
95% Adjusted-CLT UCL (Chen-1995)	0.513	97.5% Chebyshev (MVUE) UCL	0.663
95% Modified-t UCL (Johnson-1978)	0.521	99% Chebyshev (MVUE) UCL	0.762

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.17	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0271		
MLE of Mean	0.493		
MLE of Standard Deviation	0.116		
nu star	872.4		
Approximate Chi Square Value (.05)	804.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.521
Adjusted Chi Square Value	800.3	95% Jackknife UCL	0.523
		95% Standard Bootstrap UCL	0.521
Anderson-Darling Test Statistic	6.27	95% Bootstrap-t UCL	0.516
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.517
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	0.518
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	0.515
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.569
		97.5% Chebyshev(Mean, Sd) UCL	0.603
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.668
95% Approximate Gamma UCL	0.534		
95% Adjusted Gamma UCL	0.537		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.523
	or 95% Modified-t UCL	0.521

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	24	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	6.8	Minimum of Log Data	1.917
Maximum	12.83	Maximum of Log Data	2.552
Mean	9.613	Mean of log Data	2.252
Median	9.613	SD of log Data	0.153
SD	1.44		
Coefficient of Variation	0.15		
Skewness	0.155		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.12	95% H-UCL	10.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.93
95% Adjusted-CLT UCL (Chen-1995)	10.11	97.5% Chebyshev (MVUE) UCL	11.5
95% Modified-t UCL (Johnson-1978)	10.12	99% Chebyshev (MVUE) UCL	12.61
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	39.98	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.24		
MLE of Mean	9.613		
MLE of Standard Deviation	1.52		
nu star	1919		
Approximate Chi Square Value (.05)	1819	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	10.1
Adjusted Chi Square Value	1812	95% Jackknife UCL	10.12
		95% Standard Bootstrap UCL	10.09
Anderson-Darling Test Statistic	1.417	95% Bootstrap-t UCL	10.14
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	10.16
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	10.1
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	10.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.89
		97.5% Chebyshev(Mean, Sd) UCL	11.45
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.54
95% Approximate Gamma UCL	10.15		
95% Adjusted Gamma UCL	10.18		
Potential UCL to Use		Use 95% Student's-t UCL	10.12
		or 95% Modified-t UCL	10.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	129	Minimum of Log Data	4.86
Maximum	292	Maximum of Log Data	5.677
Mean	208.8	Mean of log Data	5.332
Median	208.8	SD of log Data	0.144
SD	28.52		
Coefficient of Variation	0.137		
Skewness	0.0846		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.595	Shapiro Wilk Test Statistic	0.58
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	218.7	95% H-UCL	220.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	235.7
95% Adjusted-CLT UCL (Chen-1995)	218.4	97.5% Chebyshev (MVUE) UCL	247.3
95% Modified-t UCL (Johnson-1978)	218.7	99% Chebyshev (MVUE) UCL	270.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	46.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.511		
MLE of Mean	208.8		
MLE of Standard Deviation	30.69		
nu star	2221		
Approximate Chi Square Value (.05)	2113	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	218.3
Adjusted Chi Square Value	2106	95% Jackknife UCL	218.7
		95% Standard Bootstrap UCL	218.2
Anderson-Darling Test Statistic	5.283	95% Bootstrap-t UCL	219.1
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	220.9
Kolmogorov-Smirnov Test Statistic	0.435	95% Percentile Bootstrap UCL	217.9
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	217.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	234.1
		97.5% Chebyshev(Mean, Sd) UCL	245.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	266.7
95% Approximate Gamma UCL	219.5		
95% Adjusted Gamma UCL	220.2		

Potential UCL to Use		
	Use 95% Student's-t UCL	218.7
	or 95% Modified-t UCL	218.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	11.9	Minimum of Log Data	2.477
Maximum	85	Maximum of Log Data	4.443
Mean	54.62	Mean of log Data	3.937
Median	54.62	SD of log Data	0.405
SD	17.5		
Coefficient of Variation	0.32		
Skewness	0.0593		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.765
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.74	95% H-UCL	65.31
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	75.93
95% Adjusted-CLT UCL (Chen-1995)	60.54	97.5% Chebyshev (MVUE) UCL	84.81
95% Modified-t UCL (Johnson-1978)	60.75	99% Chebyshev (MVUE) UCL	102.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.025	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.775		
MLE of Mean	54.62		
MLE of Standard Deviation	20.61		
nu star	337.2		
Approximate Chi Square Value (.05)	295.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	60.49
Adjusted Chi Square Value	292.9	95% Jackknife UCL	60.74
		95% Standard Bootstrap UCL	60.38
Anderson-Darling Test Statistic	1.731	95% Bootstrap-t UCL	60.96
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	61.14
Kolmogorov-Smirnov Test Statistic	0.255	95% Percentile Bootstrap UCL	60.32
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	60.24
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.19
		97.5% Chebyshev(Mean, Sd) UCL	76.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	90.16
95% Approximate Gamma UCL	62.29		
95% Adjusted Gamma UCL	62.87		

Potential UCL to Use		
	Use 95% Student's-t UCL	60.74
	or 95% Modified-t UCL	60.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	5.9	Minimum of Log Data	1.775
Maximum	36.5	Maximum of Log Data	3.597
Mean	14.35	Mean of log Data	2.61
Median	14.35	SD of log Data	0.332
SD	5.354		
Coefficient of Variation	0.373		
Skewness	2.952		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.475	Shapiro Wilk Test Statistic	0.571
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.22	95% H-UCL	16.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.65
95% Adjusted-CLT UCL (Chen-1995)	16.85	97.5% Chebyshev (MVUE) UCL	20.52
95% Modified-t UCL (Johnson-1978)	16.33	99% Chebyshev (MVUE) UCL	24.19

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.352	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.718		
MLE of Mean	14.35		
MLE of Standard Deviation	4.965		
nu star	400.9		
Approximate Chi Square Value (.05)	355.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	16.15
Adjusted Chi Square Value	352.5	95% Jackknife UCL	16.22
		95% Standard Bootstrap UCL	16.13
Anderson-Darling Test Statistic	5.364	95% Bootstrap-t UCL	16.98
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	25.2
Kolmogorov-Smirnov Test Statistic	0.418	95% Percentile Bootstrap UCL	16.32
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	17.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.11
		97.5% Chebyshev(Mean, Sd) UCL	21.17
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.22
95% Approximate Gamma UCL	16.18		
95% Adjusted Gamma UCL	16.32		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.22
	or 95% Modified-t UCL	16.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	75.46	Minimum of Log Data	4.324
Maximum	1860	Maximum of Log Data	7.528
Mean	715.1	Mean of log Data	6.467
Median	715.1	SD of log Data	0.547
SD	309.7		
Coefficient of Variation	0.433		
Skewness	1.946		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.686
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	823.4	95% H-UCL	940.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1120
95% Adjusted-CLT UCL (Chen-1995)	845.9	97.5% Chebyshev (MVUE) UCL	1283
95% Modified-t UCL (Johnson-1978)	827.6	99% Chebyshev (MVUE) UCL	1605

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.306	Data do not follow a Discernable Distribution (0.05)	
Theta Star	166.1		
MLE of Mean	715.1		
MLE of Standard Deviation	344.6		
nu star	206.7		
Approximate Chi Square Value (.05)	174.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	819.1
Adjusted Chi Square Value	172.3	95% Jackknife UCL	823.4
		95% Standard Bootstrap UCL	816.4
Anderson-Darling Test Statistic	2.304	95% Bootstrap-t UCL	866.1
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1457
Kolmogorov-Smirnov Test Statistic	0.269	95% Percentile Bootstrap UCL	820.7
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	842.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	990.6
		97.5% Chebyshev(Mean, Sd) UCL	1110
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1344
95% Approximate Gamma UCL	847.4		
95% Adjusted Gamma UCL	857.6		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	990.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0222	Minimum of Log Data	-3.808
Maximum	10.46	Maximum of Log Data	2.348
Mean	6.72	Mean of log Data	1.191
Median	6.72	SD of log Data	2.014
SD	3.411		
Coefficient of Variation	0.508		
Skewness	-1.065		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk Test Statistic	0.544
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.913	95% H-UCL	140.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.82
95% Adjusted-CLT UCL (Chen-1995)	7.703	97.5% Chebyshev (MVUE) UCL	86.99
95% Modified-t UCL (Johnson-1978)	7.888	99% Chebyshev (MVUE) UCL	126.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.752	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.935		
MLE of Mean	6.72		
MLE of Standard Deviation	7.749		
nu star	36.1		
Approximate Chi Square Value (.05)	23.35	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	7.865
Adjusted Chi Square Value	22.63	95% Jackknife UCL	7.913
		95% Standard Bootstrap UCL	7.861
Anderson-Darling Test Statistic	5.095	95% Bootstrap-t UCL	7.766
Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	7.749
Kolmogorov-Smirnov Test Statistic	0.478	95% Percentile Bootstrap UCL	7.822
Kolmogorov-Smirnov 5% Critical Value	0.184	95% BCA Bootstrap UCL	7.696
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.754
		97.5% Chebyshev(Mean, Sd) UCL	11.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.65
95% Approximate Gamma UCL	10.39		
95% Adjusted Gamma UCL	10.72		

Potential UCL to Use	Use 97.5% Chebyshev (Mean, Sd) UC	11.07
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	13.5	Minimum of Log Data	2.603
Maximum	131.9	Maximum of Log Data	4.882
Mean	65.56	Mean of log Data	4.113
Median	65.56	SD of log Data	0.441
SD	20.76		
Coefficient of Variation	0.317		
Skewness	0.345		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.542
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.83	95% H-UCL	80.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	94.2
95% Adjusted-CLT UCL (Chen-1995)	72.85	97.5% Chebyshev (MVUE) UCL	105.9
95% Modified-t UCL (Johnson-1978)	72.88	99% Chebyshev (MVUE) UCL	129

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.434	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.19		
MLE of Mean	65.56		
MLE of Standard Deviation	25.85		
nu star	308.8		
Approximate Chi Square Value (.05)	269.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	72.53
Adjusted Chi Square Value	266.5	95% Jackknife UCL	72.83
		95% Standard Bootstrap UCL	72.3
Anderson-Darling Test Statistic	5.014	95% Bootstrap-t UCL	72.54
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	75.68
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	72.49
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	72.86
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	84.04
		97.5% Chebyshev(Mean, Sd) UCL	92.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	107.7
95% Approximate Gamma UCL	75.24		
95% Adjusted Gamma UCL	75.97		

Potential UCL to Use		
	Use 95% Student's-t UCL	72.83
	or 95% Modified-t UCL	72.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.18	Minimum of Log Data	-1.715
Maximum	0.42	Maximum of Log Data	-0.868
Mean	0.298	Mean of log Data	-1.222
Median	0.298	SD of log Data	0.143
SD	0.0403		
Coefficient of Variation	0.135		
Skewness	0.111		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.588	Shapiro Wilk Test Statistic	0.572
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.312	95% H-UCL	0.314
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.336
95% Adjusted-CLT UCL (Chen-1995)	0.311	97.5% Chebyshev (MVUE) UCL	0.352
95% Modified-t UCL (Johnson-1978)	0.312	99% Chebyshev (MVUE) UCL	0.385

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	46.99	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00633		
MLE of Mean	0.298		
MLE of Standard Deviation	0.0434		
nu star	2256		
Approximate Chi Square Value (.05)	2146	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.311
Adjusted Chi Square Value	2139	95% Jackknife UCL	0.312
		95% Standard Bootstrap UCL	0.311
Anderson-Darling Test Statistic	5.272	95% Bootstrap-t UCL	0.312
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.318
Kolmogorov-Smirnov Test Statistic	0.435	95% Percentile Bootstrap UCL	0.311
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	0.31
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.333
		97.5% Chebyshev(Mean, Sd) UCL	0.349
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.379
95% Approximate Gamma UCL	0.313		
95% Adjusted Gamma UCL	0.314		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.312
	or 95% Modified-t UCL	0.312

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0072	Minimum of Log Data	-4.934
Maximum	0.478	Maximum of Log Data	-0.737
Mean	0.301	Mean of log Data	-1.322
Median	0.301	SD of log Data	0.778
SD	0.0756		
Coefficient of Variation	0.251		
Skewness	-2.006		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.467	Shapiro Wilk Test Statistic	0.284
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.328	95% H-UCL	0.521
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.622
95% Adjusted-CLT UCL (Chen-1995)	0.32	97.5% Chebyshev (MVUE) UCL	0.738
95% Modified-t UCL (Johnson-1978)	0.327	99% Chebyshev (MVUE) UCL	0.965

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.734	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0807		
MLE of Mean	0.301		
MLE of Standard Deviation	0.156		
nu star	179.2		
Approximate Chi Square Value (.05)	149.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.327
Adjusted Chi Square Value	147.4	95% Jackknife UCL	0.328
		95% Standard Bootstrap UCL	0.326
Anderson-Darling Test Statistic	7.188	95% Bootstrap-t UCL	0.324
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.325
Kolmogorov-Smirnov Test Statistic	0.523	95% Percentile Bootstrap UCL	0.323
Kolmogorov-Smirnov 5% Critical Value	0.179	95% BCA Bootstrap UCL	0.321
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.369
		97.5% Chebyshev(Mean, Sd) UCL	0.398
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.455
95% Approximate Gamma UCL	0.362		
95% Adjusted Gamma UCL	0.367		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.369

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	2.1	Minimum of Log Data	0.742
Maximum	30.24	Maximum of Log Data	3.409
Mean	15.46	Mean of log Data	2.637
Median	15.46	SD of log Data	0.552
SD	5.449		
Coefficient of Variation	0.353		
Skewness	-0.202		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.836	Shapiro Wilk Test Statistic	0.655
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.36	95% H-UCL	20.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.46
95% Adjusted-CLT UCL (Chen-1995)	17.24	97.5% Chebyshev (MVUE) UCL	28.05
95% Modified-t UCL (Johnson-1978)	17.35	99% Chebyshev (MVUE) UCL	35.11

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.496	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.438		
MLE of Mean	15.46		
MLE of Standard Deviation	7.289		
nu star	215.8		
Approximate Chi Square Value (.05)	182.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	17.29
Adjusted Chi Square Value	180.7	95% Jackknife UCL	17.36
		95% Standard Bootstrap UCL	17.19
Anderson-Darling Test Statistic	2.814	95% Bootstrap-t UCL	17.22
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	17.39
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	17.2
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	17.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.3
		97.5% Chebyshev(Mean, Sd) UCL	22.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.52
95% Approximate Gamma UCL	18.25		
95% Adjusted Gamma UCL	18.46		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	20.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.058	Minimum of Log Data	-2.847
Maximum	0.259	Maximum of Log Data	-1.351
Mean	0.153	Mean of log Data	-1.899
Median	0.153	SD of log Data	0.23
SD	0.0298		
Coefficient of Variation	0.195		
Skewness	0.597		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.431	Shapiro Wilk Test Statistic	0.399
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.163	95% H-UCL	0.167
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.185
95% Adjusted-CLT UCL (Chen-1995)	0.164	97.5% Chebyshev (MVUE) UCL	0.199
95% Modified-t UCL (Johnson-1978)	0.164	99% Chebyshev (MVUE) UCL	0.226

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.43	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00749		
MLE of Mean	0.153		
MLE of Standard Deviation	0.0338		
nu star	980.9		
Approximate Chi Square Value (.05)	909.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	0.163
Adjusted Chi Square Value	904.3	95% Jackknife UCL	0.163
		95% Standard Bootstrap UCL	0.163
Anderson-Darling Test Statistic	6.801	95% Bootstrap-t UCL	0.163
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.169
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	0.162
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	0.162
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.179
		97.5% Chebyshev(Mean, Sd) UCL	0.191
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.213
95% Approximate Gamma UCL	0.165		
95% Adjusted Gamma UCL	0.166		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.163
		or 95% Modified-t UCL	0.164

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Uranium-238

General Statistics

Number of Valid Observations	24	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	1.09	Minimum of Log Data	0.0862
Maximum	6.5	Maximum of Log Data	1.872
Mean	3.507	Mean of log Data	1.224
Median	3.507	SD of log Data	0.276
SD	0.811		
Coefficient of Variation	0.231		
Skewness	1.112		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.45	Shapiro Wilk Test Statistic	0.419
Shapiro Wilk Critical Value	0.916	Shapiro Wilk Critical Value	0.916
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.79	95% H-UCL	3.923
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.407
95% Adjusted-CLT UCL (Chen-1995)	3.819	97.5% Chebyshev (MVUE) UCL	4.787
95% Modified-t UCL (Johnson-1978)	3.797	99% Chebyshev (MVUE) UCL	5.534

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.54	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.241		
MLE of Mean	3.507		
MLE of Standard Deviation	0.92		
nu star	697.7		
Approximate Chi Square Value (.05)	637.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0392	95% CLT UCL	3.779
Adjusted Chi Square Value	633.4	95% Jackknife UCL	3.79
		95% Standard Bootstrap UCL	3.778
Anderson-Darling Test Statistic	6.508	95% Bootstrap-t UCL	3.801
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	4.077
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	3.78
Kolmogorov-Smirnov 5% Critical Value	0.178	95% BCA Bootstrap UCL	3.833
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.228
		97.5% Chebyshev(Mean, Sd) UCL	4.541
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.154
95% Approximate Gamma UCL	3.838		
95% Adjusted Gamma UCL	3.863		

Potential UCL to Use		
	Use 95% Student's-t UCL	3.79
	or 95% Modified-t UCL	3.797

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Time
User Selected Options

From File	138-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	6730	Minimum of Log Data	8.814
Maximum	13000	Maximum of Log Data	9.473
Mean	10427	Mean of log Data	9.247
Median	10427	SD of log Data	0.105
SD	983.7		
Coefficient of Variation	0.0943		
Skewness	-1.4		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.591	Shapiro Wilk Test Statistic	0.547
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10750	95% H-UCL	10806
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11347
95% Adjusted-CLT UCL (Chen-1995)	10684	97.5% Chebyshev (MVUE) UCL	11744
95% Modified-t UCL (Johnson-1978)	10741	99% Chebyshev (MVUE) UCL	12522

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	91.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	114.2		
MLE of Mean	10427		
MLE of Standard Deviation	1091		
nu star	4930		
Approximate Chi Square Value (.05)	4768	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	10738
Adjusted Chi Square Value	4758	95% Jackknife UCL	10750
		95% Standard Bootstrap UCL	10739
Anderson-Darling Test Statistic	5.524	95% Bootstrap-t UCL	10702
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	10746
Kolmogorov-Smirnov Test Statistic	0.439	95% Percentile Bootstrap UCL	10714
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	10676
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11252
		97.5% Chebyshev(Mean, Sd) UCL	11609
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12310
95% Approximate Gamma UCL	10781		
95% Adjusted Gamma UCL	10804		

Potential UCL to Use		
	Use 95% Student's-t UCL	10750
	or 95% Modified-t UCL	10741

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	0.18	Minimum of Log Data	-1.715
Maximum	7.34	Maximum of Log Data	1.993
Mean	3.035	Mean of log Data	0.754
Median	3.035	SD of log Data	1.081
SD	1.808		
Coefficient of Variation	0.596		
Skewness	0.0578		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.629	95% H-UCL	6.652
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.569
95% Adjusted-CLT UCL (Chen-1995)	3.612	97.5% Chebyshev (MVUE) UCL	9.248
95% Modified-t UCL (Johnson-1978)	3.63	99% Chebyshev (MVUE) UCL	12.55

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.166		
MLE of Mean	3.035		
MLE of Standard Deviation	2.564		
nu star	75.69		
Approximate Chi Square Value (.05)	56.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	3.608
Adjusted Chi Square Value	55.59	95% Jackknife UCL	3.629
		95% Standard Bootstrap UCL	3.599
Anderson-Darling Test Statistic	2.943	95% Bootstrap-t UCL	3.615
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	3.63
Kolmogorov-Smirnov Test Statistic	0.384	95% Percentile Bootstrap UCL	3.605
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	3.579
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.552
		97.5% Chebyshev(Mean, Sd) UCL	5.209
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.498
95% Approximate Gamma UCL	4.056		
95% Adjusted Gamma UCL	4.132		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	4.552

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	27	Number of Distinct Observations	25

Raw Statistics		Log-transformed Statistics	
Minimum	5.39	Minimum of Log Data	1.685
Maximum	15.45	Maximum of Log Data	2.738
Mean	9.669	Mean of log Data	2.219
Median	8.79	SD of log Data	0.321
SD	3.137		
Coefficient of Variation	0.324		
Skewness	0.548		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.7	95% H-UCL	10.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.32
95% Adjusted-CLT UCL (Chen-1995)	10.73	97.5% Chebyshev (MVUE) UCL	13.47
95% Modified-t UCL (Johnson-1978)	10.71	99% Chebyshev (MVUE) UCL	15.72

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.084	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.064		
MLE of Mean	9.669		
MLE of Standard Deviation	3.208		
nu star	490.5		
Approximate Chi Square Value (.05)	440.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	10.66
Adjusted Chi Square Value	437.1	95% Jackknife UCL	10.7
		95% Standard Bootstrap UCL	10.61
Anderson-Darling Test Statistic	0.535	95% Bootstrap-t UCL	10.78
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	10.75
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	10.71
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	10.72
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.3
		97.5% Chebyshev(Mean, Sd) UCL	13.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.68
95% Approximate Gamma UCL	10.77		
95% Adjusted Gamma UCL	10.85		

Potential UCL to Use		Use 95% Approximate Gamma UCL	10.77

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	65.9	Minimum of Log Data	4.188
Maximum	529	Maximum of Log Data	6.271
Mean	171.4	Mean of log Data	5.067
Median	171.4	SD of log Data	0.377
SD	83.69		
Coefficient of Variation	0.488		
Skewness	3.203		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	198.8	95% H-UCL	195.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	224.9
95% Adjusted-CLT UCL (Chen-1995)	208.5	97.5% Chebyshev (MVUE) UCL	248.7
95% Modified-t UCL (Johnson-1978)	200.5	99% Chebyshev (MVUE) UCL	295.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.933	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.88		
MLE of Mean	171.4		
MLE of Standard Deviation	70.35		
nu star	320.4		
Approximate Chi Square Value (.05)	279.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	197.8
Adjusted Chi Square Value	277.5	95% Jackknife UCL	198.8
		95% Standard Bootstrap UCL	197.8
Anderson-Darling Test Statistic	2.278	95% Bootstrap-t UCL	223.9
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	338.4
Kolmogorov-Smirnov Test Statistic	0.322	95% Percentile Bootstrap UCL	199.9
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	212.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	241.6
		97.5% Chebyshev(Mean, Sd) UCL	271.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	331.6
95% Approximate Gamma UCL	196.1		
95% Adjusted Gamma UCL	197.8		

Potential UCL to Use		
	Use 95% Student's-t UCL	198.8
	or 95% Modified-t UCL	200.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	0.86	Maximum of Log Data	-0.151
Mean	0.597	Mean of log Data	-0.529
Median	0.597	SD of log Data	0.17
SD	0.0958		
Coefficient of Variation	0.161		
Skewness	0.439		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.604	Shapiro Wilk Test Statistic	0.592
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.628	95% H-UCL	0.633
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.682
95% Adjusted-CLT UCL (Chen-1995)	0.629	97.5% Chebyshev (MVUE) UCL	0.719
95% Modified-t UCL (Johnson-1978)	0.628	99% Chebyshev (MVUE) UCL	0.792

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	34.1	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0175		
MLE of Mean	0.597		
MLE of Standard Deviation	0.102		
nu star	1841		
Approximate Chi Square Value (.05)	1743	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	0.627
Adjusted Chi Square Value	1737	95% Jackknife UCL	0.628
		95% Standard Bootstrap UCL	0.626
Anderson-Darling Test Statistic	5.496	95% Bootstrap-t UCL	0.63
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.653
Kolmogorov-Smirnov Test Statistic	0.404	95% Percentile Bootstrap UCL	0.628
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	0.628
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.677
		97.5% Chebyshev(Mean, Sd) UCL	0.712
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.78
95% Approximate Gamma UCL	0.63		
95% Adjusted Gamma UCL	0.633		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.628
	or 95% Modified-t UCL	0.628

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.024	Minimum of Log Data	-3.73
Maximum	7.3	Maximum of Log Data	1.988
Mean	3.347	Mean of log Data	0.713
Median	3.347	SD of log Data	1.504
SD	1.816		
Coefficient of Variation	0.543		
Skewness	-0.438		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Test Statistic	0.628
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.943	95% H-UCL	16.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15
95% Adjusted-CLT UCL (Chen-1995)	3.891	97.5% Chebyshev (MVUE) UCL	18.97
95% Modified-t UCL (Johnson-1978)	3.938	99% Chebyshev (MVUE) UCL	26.76

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.044	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.206		
MLE of Mean	3.347		
MLE of Standard Deviation	3.276		
nu star	56.39		
Approximate Chi Square Value (.05)	40.13	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	3.922
Adjusted Chi Square Value	39.25	95% Jackknife UCL	3.943
		95% Standard Bootstrap UCL	3.917
Anderson-Darling Test Statistic	4.094	95% Bootstrap-t UCL	3.939
Anderson-Darling 5% Critical Value	0.77	95% Hall's Bootstrap UCL	3.93
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	3.907
Kolmogorov-Smirnov 5% Critical Value	0.173	95% BCA Bootstrap UCL	3.874
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.871
		97.5% Chebyshev(Mean, Sd) UCL	5.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.825
95% Approximate Gamma UCL	4.703		
95% Adjusted Gamma UCL	4.809		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	4.871

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	85	Maximum of Log Data	4.443
Mean	53.27	Mean of log Data	3.837
Median	46.07	SD of log Data	0.625
SD	23.68		
Coefficient of Variation	0.444		
Skewness	0.0995		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.879	Shapiro Wilk Test Statistic	0.789
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	61.04	95% H-UCL	72.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	87.16
95% Adjusted-CLT UCL (Chen-1995)	60.86	97.5% Chebyshev (MVUE) UCL	100.7
95% Modified-t UCL (Johnson-1978)	61.06	99% Chebyshev (MVUE) UCL	127.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.76		
MLE of Mean	53.27		
MLE of Standard Deviation	28.98		
nu star	182.5		
Approximate Chi Square Value (.05)	152.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	60.77
Adjusted Chi Square Value	150.5	95% Jackknife UCL	61.04
		95% Standard Bootstrap UCL	60.71
Anderson-Darling Test Statistic	1.19	95% Bootstrap-t UCL	61.1
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	60.99
Kolmogorov-Smirnov Test Statistic	0.171	95% Percentile Bootstrap UCL	60.79
Kolmogorov-Smirnov 5% Critical Value	0.169	95% BCA Bootstrap UCL	60.18
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.13
		97.5% Chebyshev(Mean, Sd) UCL	81.73
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	98.61
95% Approximate Gamma UCL	63.86		
95% Adjusted Gamma UCL	64.6		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	73.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	2.7	Minimum of Log Data	0.993
Maximum	17.6	Maximum of Log Data	2.868
Mean	8.45	Mean of log Data	2.1
Median	8.45	SD of log Data	0.282
SD	2.235		
Coefficient of Variation	0.264		
Skewness	2.025		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.52	Shapiro Wilk Test Statistic	0.534
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.184	95% H-UCL	9.391
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.52
95% Adjusted-CLT UCL (Chen-1995)	9.336	97.5% Chebyshev (MVUE) UCL	11.4
95% Modified-t UCL (Johnson-1978)	9.211	99% Chebyshev (MVUE) UCL	13.13

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.14	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.643		
MLE of Mean	8.45		
MLE of Standard Deviation	2.331		
nu star	709.7		
Approximate Chi Square Value (.05)	648.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	9.157
Adjusted Chi Square Value	645.2	95% Jackknife UCL	9.184
		95% Standard Bootstrap UCL	9.149
Anderson-Darling Test Statistic	5.938	95% Bootstrap-t UCL	9.319
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	13.33
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	9.176
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	9.389
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.32
		97.5% Chebyshev(Mean, Sd) UCL	11.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.73
95% Approximate Gamma UCL	9.242		
95% Adjusted Gamma UCL	9.295		

Potential UCL to Use		
	Use 95% Student's-t UCL	9.184
	or 95% Modified-t UCL	9.211

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	27

Raw Statistics		Log-transformed Statistics	
Minimum	11911	Minimum of Log Data	9.385
Maximum	40820	Maximum of Log Data	10.62
Mean	17816	Mean of log Data	9.743
Median	15188	SD of log Data	0.284
SD	6283		
Coefficient of Variation	0.353		
Skewness	2.349		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.725	Shapiro Wilk Test Statistic	0.837
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19879	95% H-UCL	19625
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21996
95% Adjusted-CLT UCL (Chen-1995)	20389	97.5% Chebyshev (MVUE) UCL	23847
95% Modified-t UCL (Johnson-1978)	19970	99% Chebyshev (MVUE) UCL	27485

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.18	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1751		
MLE of Mean	17816		
MLE of Standard Deviation	5585		
nu star	549.5		
Approximate Chi Square Value (.05)	496.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	19805
Adjusted Chi Square Value	492.9	95% Jackknife UCL	19879
		95% Standard Bootstrap UCL	19814
Anderson-Darling Test Statistic	1.918	95% Bootstrap-t UCL	21218
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	23575
Kolmogorov-Smirnov Test Statistic	0.251	95% Percentile Bootstrap UCL	19857
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	20252
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23087
		97.5% Chebyshev(Mean, Sd) UCL	25368
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29848
95% Approximate Gamma UCL	19732		
95% Adjusted Gamma UCL	19862		

Potential UCL to Use		
	Use 95% Student's-t UCL	19879
	or 95% Modified-t UCL	19970

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	27

Raw Statistics		Log-transformed Statistics	
Minimum	294.4	Minimum of Log Data	5.685
Maximum	1230	Maximum of Log Data	7.115
Mean	575.8	Mean of log Data	6.285
Median	510.9	SD of log Data	0.374
SD	235		
Coefficient of Variation	0.408		
Skewness	1.222		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	653	95% H-UCL	660.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	758.5
95% Adjusted-CLT UCL (Chen-1995)	661.6	97.5% Chebyshev (MVUE) UCL	838.4
95% Modified-t UCL (Johnson-1978)	654.8	99% Chebyshev (MVUE) UCL	995.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.449	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	89.3		
MLE of Mean	575.8		
MLE of Standard Deviation	226.8		
nu star	348.2		
Approximate Chi Square Value (.05)	306	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	650.2
Adjusted Chi Square Value	303.5	95% Jackknife UCL	653
		95% Standard Bootstrap UCL	647.1
Anderson-Darling Test Statistic	0.472	95% Bootstrap-t UCL	667.4
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	666.4
Kolmogorov-Smirnov Test Statistic	0.098	95% Percentile Bootstrap UCL	652.4
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	664.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	773
		97.5% Chebyshev(Mean, Sd) UCL	858.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1026
95% Approximate Gamma UCL	655.3		
95% Adjusted Gamma UCL	660.8		

Potential UCL to Use		Use 95% Approximate Gamma UCL	655.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.0141	Minimum of Log Data	-4.262
Maximum	21.3	Maximum of Log Data	3.059
Mean	8.3	Mean of log Data	1.328
Median	10	SD of log Data	2.125
SD	5.203		
Coefficient of Variation	0.627		
Skewness	0.25		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.833	Shapiro Wilk Test Statistic	0.607
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.01	95% H-UCL	211.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.81
95% Adjusted-CLT UCL (Chen-1995)	9.999	97.5% Chebyshev (MVUE) UCL	126.2
95% Modified-t UCL (Johnson-1978)	10.02	99% Chebyshev (MVUE) UCL	184.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.698	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.88		
MLE of Mean	8.3		
MLE of Standard Deviation	9.932		
nu star	37.71		
Approximate Chi Square Value (.05)	24.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	9.947
Adjusted Chi Square Value	23.98	95% Jackknife UCL	10.01
		95% Standard Bootstrap UCL	9.956
Anderson-Darling Test Statistic	4.241	95% Bootstrap-t UCL	10.03
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	10.09
Kolmogorov-Smirnov Test Statistic	0.346	95% Percentile Bootstrap UCL	9.901
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	9.944
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.66
		97.5% Chebyshev(Mean, Sd) UCL	14.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.26
95% Approximate Gamma UCL	12.7		
95% Adjusted Gamma UCL	13.06		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	14.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	27	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	101.7	Maximum of Log Data	4.622
Mean	51.2	Mean of log Data	3.602
Median	65	SD of log Data	0.984
SD	30.83		
Coefficient of Variation	0.602		
Skewness	-0.372		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.762
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	61.32	95% H-UCL	96.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	112.5
95% Adjusted-CLT UCL (Chen-1995)	60.5	97.5% Chebyshev (MVUE) UCL	136.1
95% Modified-t UCL (Johnson-1978)	61.25	99% Chebyshev (MVUE) UCL	182.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.487	Data do not follow a Discernable Distribution (0.05)	
Theta Star	34.44		
MLE of Mean	51.2		
MLE of Standard Deviation	41.99		
nu star	80.27		
Approximate Chi Square Value (.05)	60.63	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	60.96
Adjusted Chi Square Value	59.54	95% Jackknife UCL	61.32
		95% Standard Bootstrap UCL	61.29
Anderson-Darling Test Statistic	3.052	95% Bootstrap-t UCL	60.46
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	60.23
Kolmogorov-Smirnov Test Statistic	0.378	95% Percentile Bootstrap UCL	60.58
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	60.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.06
		97.5% Chebyshev(Mean, Sd) UCL	88.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.2
95% Approximate Gamma UCL	67.78		
95% Adjusted Gamma UCL	69.03		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	77.06

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	5	Maximum of Log Data	1.609
Mean	1.408	Mean of log Data	-0.236
Median	1.408	SD of log Data	1.271
SD	1.412		
Coefficient of Variation	1.003		
Skewness	1.812		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.676	Shapiro Wilk Test Statistic	0.79
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.872	95% H-UCL	3.643
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.84
95% Adjusted-CLT UCL (Chen-1995)	1.957	97.5% Chebyshev (MVUE) UCL	4.773
95% Modified-t UCL (Johnson-1978)	1.888	99% Chebyshev (MVUE) UCL	6.605
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.912	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.545		
MLE of Mean	1.408		
MLE of Standard Deviation	1.475		
nu star	49.23		
Approximate Chi Square Value (.05)	34.12	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	1.855
Adjusted Chi Square Value	33.32	95% Jackknife UCL	1.872
		95% Standard Bootstrap UCL	1.846
Anderson-Darling Test Statistic	2.29	95% Bootstrap-t UCL	2.04
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	1.985
Kolmogorov-Smirnov Test Statistic	0.299	95% Percentile Bootstrap UCL	1.846
Kolmogorov-Smirnov 5% Critical Value	0.173	95% BCA Bootstrap UCL	2.039
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.593
		97.5% Chebyshev(Mean, Sd) UCL	3.105
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.112
95% Approximate Gamma UCL	2.032		
95% Adjusted Gamma UCL	2.081		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.593

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.021	Minimum of Log Data	-3.863
Maximum	10.09	Maximum of Log Data	2.312
Mean	6.836	Mean of log Data	0.969
Median	10	SD of log Data	2.264
SD	4.149		
Coefficient of Variation	0.607		
Skewness	-0.82		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.709	Shapiro Wilk Test Statistic	0.611
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.198	95% H-UCL	250.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	91.84
95% Adjusted-CLT UCL (Chen-1995)	8.015	97.5% Chebyshev (MVUE) UCL	120.3
95% Modified-t UCL (Johnson-1978)	8.177	99% Chebyshev (MVUE) UCL	176.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.595	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.48		
MLE of Mean	6.836		
MLE of Standard Deviation	8.859		
nu star	32.16		
Approximate Chi Square Value (.05)	20.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	8.15
Adjusted Chi Square Value	19.59	95% Jackknife UCL	8.198
		95% Standard Bootstrap UCL	8.108
Anderson-Darling Test Statistic	4.937	95% Bootstrap-t UCL	8.056
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	7.979
Kolmogorov-Smirnov Test Statistic	0.353	95% Percentile Bootstrap UCL	8.101
Kolmogorov-Smirnov 5% Critical Value	0.176	95% BCA Bootstrap UCL	7.97
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.32
		97.5% Chebyshev(Mean, Sd) UCL	11.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.78
95% Approximate Gamma UCL	10.89		
95% Adjusted Gamma UCL	11.22		

Potential UCL to Use	Use 97.5% Chebyshev (Mean, Sd) UCL	11.82
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.19	Minimum of Log Data	-1.661
Maximum	5	Maximum of Log Data	1.609
Mean	2.843	Mean of log Data	0.686
Median	2.843	SD of log Data	1.093
SD	1.649		
Coefficient of Variation	0.58		
Skewness	-0.246		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Test Statistic	0.703
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.384	95% H-UCL	6.363
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.211
95% Adjusted-CLT UCL (Chen-1995)	3.349	97.5% Chebyshev (MVUE) UCL	8.822
95% Modified-t UCL (Johnson-1978)	3.382	99% Chebyshev (MVUE) UCL	11.98

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.391	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.044		
MLE of Mean	2.843		
MLE of Standard Deviation	2.411		
nu star	75.1		
Approximate Chi Square Value (.05)	56.14	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	3.365
Adjusted Chi Square Value	55.09	95% Jackknife UCL	3.384
		95% Standard Bootstrap UCL	3.359
Anderson-Darling Test Statistic	3.102	95% Bootstrap-t UCL	3.35
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	3.348
Kolmogorov-Smirnov Test Statistic	0.385	95% Percentile Bootstrap UCL	3.358
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	3.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.227
		97.5% Chebyshev(Mean, Sd) UCL	4.825
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.001
95% Approximate Gamma UCL	3.803		
95% Adjusted Gamma UCL	3.876		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	4.227

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	15.3	Minimum of Log Data	2.728
Maximum	42.8	Maximum of Log Data	3.757
Mean	28.53	Mean of log Data	3.34
Median	28.53	SD of log Data	0.157
SD	4.118		
Coefficient of Variation	0.144		
Skewness	0.188		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.558	Shapiro Wilk Test Statistic	0.535
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	29.88	95% H-UCL	30.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	32.34
95% Adjusted-CLT UCL (Chen-1995)	29.87	97.5% Chebyshev (MVUE) UCL	33.97
95% Modified-t UCL (Johnson-1978)	29.89	99% Chebyshev (MVUE) UCL	37.19

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	40.56	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.703		
MLE of Mean	28.53		
MLE of Standard Deviation	4.48		
nu star	2190		
Approximate Chi Square Value (.05)	2083	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	29.84
Adjusted Chi Square Value	2076	95% Jackknife UCL	29.88
		95% Standard Bootstrap UCL	29.82
Anderson-Darling Test Statistic	6.004	95% Bootstrap-t UCL	29.81
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	30.42
Kolmogorov-Smirnov Test Statistic	0.446	95% Percentile Bootstrap UCL	29.82
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	29.86
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.99
		97.5% Chebyshev(Mean, Sd) UCL	33.48
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	36.42
95% Approximate Gamma UCL	30.01		
95% Adjusted Gamma UCL	30.11		

Potential UCL to Use		
	Use 95% Student's-t UCL	29.88
	or 95% Modified-t UCL	29.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	138-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	2.9	Minimum of Log Data	1.065
Maximum	11.82	Maximum of Log Data	2.47
Mean	9.304	Mean of log Data	2.175
Median	11	SD of log Data	0.375
SD	2.651		
Coefficient of Variation	0.285		
Skewness	-1.209		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.707
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.33	95% H-UCL	11.13
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.93
95% Adjusted-CLT UCL (Chen-1995)	10.11	97.5% Chebyshev (MVUE) UCL	14.45
95% Modified-t UCL (Johnson-1978)	10.3	99% Chebyshev (MVUE) UCL	17.44

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.877	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.181		
MLE of Mean	9.304		
MLE of Standard Deviation	3.315		
nu star	315.1		
Approximate Chi Square Value (.05)	275	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	10.28
Adjusted Chi Square Value	272	95% Jackknife UCL	10.33
		95% Standard Bootstrap UCL	10.26
Anderson-Darling Test Statistic	2.523	95% Bootstrap-t UCL	10.22
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	10.08
Kolmogorov-Smirnov Test Statistic	0.336	95% Percentile Bootstrap UCL	10.21
Kolmogorov-Smirnov 5% Critical Value	0.194	95% BCA Bootstrap UCL	10.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.89
		97.5% Chebyshev(Mean, Sd) UCL	13.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.2
95% Approximate Gamma UCL	10.66		
95% Adjusted Gamma UCL	10.78		

Potential UCL to Use		Use 95% Student's-t UCL	10.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.019	Minimum of Log Data	-3.963
Maximum	0.93	Maximum of Log Data	-0.0726
Mean	0.335	Mean of log Data	-1.277
Median	0.335	SD of log Data	0.791
SD	0.169		
Coefficient of Variation	0.506		
Skewness	1.89		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.595	Shapiro Wilk Test Statistic	0.551
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.401	95% H-UCL	0.583
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.685
95% Adjusted-CLT UCL (Chen-1995)	0.415	97.5% Chebyshev (MVUE) UCL	0.82
95% Modified-t UCL (Johnson-1978)	0.403	99% Chebyshev (MVUE) UCL	1.085
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.47	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.136		
MLE of Mean	0.335		
MLE of Standard Deviation	0.213		
nu star	98.79		
Approximate Chi Square Value (.05)	76.86	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	0.398
Adjusted Chi Square Value	75.33	95% Jackknife UCL	0.401
		95% Standard Bootstrap UCL	0.395
Anderson-Darling Test Statistic	4.066	95% Bootstrap-t UCL	0.412
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.76
Kolmogorov-Smirnov Test Statistic	0.429	95% Percentile Bootstrap UCL	0.4
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	0.415
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.5
		97.5% Chebyshev(Mean, Sd) UCL	0.572
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.712
95% Approximate Gamma UCL	0.431		
95% Adjusted Gamma UCL	0.44		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	11.3	Minimum of Log Data	2.425
Maximum	85	Maximum of Log Data	4.443
Mean	50.34	Mean of log Data	3.776
Median	47.04	SD of log Data	0.599
SD	24.35		
Coefficient of Variation	0.484		
Skewness	0.199		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	59.75	95% H-UCL	69.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	83.41
95% Adjusted-CLT UCL (Chen-1995)	59.55	97.5% Chebyshev (MVUE) UCL	97.14
95% Modified-t UCL (Johnson-1978)	59.79	99% Chebyshev (MVUE) UCL	124.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.139	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	16.04		
MLE of Mean	50.34		
MLE of Standard Deviation	28.41		
nu star	125.6		
Approximate Chi Square Value (.05)	100.7	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	59.29
Adjusted Chi Square Value	98.91	95% Jackknife UCL	59.75
		95% Standard Bootstrap UCL	59.17
Anderson-Darling Test Statistic	0.654	95% Bootstrap-t UCL	59.56
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	59.69
Kolmogorov-Smirnov Test Statistic	0.147	95% Percentile Bootstrap UCL	59.32
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	59.46
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.07
		97.5% Chebyshev(Mean, Sd) UCL	84.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.5
95% Approximate Gamma UCL	62.78		
95% Adjusted Gamma UCL	63.89		

Potential UCL to Use	Use 95% Approximate Gamma UCL	62.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.0094	Minimum of Log Data	-4.667
Maximum	10	Maximum of Log Data	2.303
Mean	7.426	Mean of log Data	0.835
Median	10	SD of log Data	2.633
SD	4.388		
Coefficient of Variation	0.591		
Skewness	-1.226		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.571	Shapiro Wilk Test Statistic	0.59
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.123	95% H-UCL	2009
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	174.5
95% Adjusted-CLT UCL (Chen-1995)	8.753	97.5% Chebyshev (MVUE) UCL	231.7
95% Modified-t UCL (Johnson-1978)	9.078	99% Chebyshev (MVUE) UCL	344

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.16		
MLE of Mean	7.426		
MLE of Standard Deviation	10.61		
nu star	19.59		
Approximate Chi Square Value (.05)	10.55	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	9.04
Adjusted Chi Square Value	10.03	95% Jackknife UCL	9.123
		95% Standard Bootstrap UCL	9.003
Anderson-Darling Test Statistic	4.843	95% Bootstrap-t UCL	8.844
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	8.714
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	8.92
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	8.832
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.7
		97.5% Chebyshev(Mean, Sd) UCL	13.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.19
95% Approximate Gamma UCL	13.79		
95% Adjusted Gamma UCL	14.51		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.19
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	6.6	Minimum of Log Data	1.887
Maximum	113.2	Maximum of Log Data	4.729
Mean	66.59	Mean of log Data	3.985
Median	65	SD of log Data	0.845
SD	30.15		
Coefficient of Variation	0.453		
Skewness	-0.681		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Test Statistic	0.658
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	78.25	95% H-UCL	122.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	142.7
95% Adjusted-CLT UCL (Chen-1995)	76.58	97.5% Chebyshev (MVUE) UCL	171.9
95% Modified-t UCL (Johnson-1978)	78.08	99% Chebyshev (MVUE) UCL	229.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.153	Data do not follow a Discernable Distribution (0.05)	
Theta Star	30.93		
MLE of Mean	66.59		
MLE of Standard Deviation	45.38		
nu star	86.11		
Approximate Chi Square Value (.05)	65.72	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	77.68
Adjusted Chi Square Value	64.31	95% Jackknife UCL	78.25
		95% Standard Bootstrap UCL	77.29
Anderson-Darling Test Statistic	2.497	95% Bootstrap-t UCL	77.21
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	77.01
Kolmogorov-Smirnov Test Statistic	0.37	95% Percentile Bootstrap UCL	76.81
Kolmogorov-Smirnov 5% Critical Value	0.196	95% BCA Bootstrap UCL	76.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.98
		97.5% Chebyshev(Mean, Sd) UCL	108.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	133.7
95% Approximate Gamma UCL	87.25		
95% Adjusted Gamma UCL	89.16		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	95.98

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.092	Minimum of Log Data	-2.386
Maximum	5	Maximum of Log Data	1.609
Mean	3.972	Mean of log Data	1.032
Median	5	SD of log Data	1.239
SD	1.691		
Coefficient of Variation	0.426		
Skewness	-1.806		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.623	Shapiro Wilk Test Statistic	0.515
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.625	95% H-UCL	14.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.64
95% Adjusted-CLT UCL (Chen-1995)	4.43	97.5% Chebyshev (MVUE) UCL	17.08
95% Modified-t UCL (Johnson-1978)	4.6	99% Chebyshev (MVUE) UCL	23.84

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.38	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.877		
MLE of Mean	3.972		
MLE of Standard Deviation	3.38		
nu star	55.22		
Approximate Chi Square Value (.05)	39.14	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	4.594
Adjusted Chi Square Value	38.07	95% Jackknife UCL	4.625
		95% Standard Bootstrap UCL	4.592
Anderson-Darling Test Statistic	4.531	95% Bootstrap-t UCL	4.505
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	4.444
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	4.511
Kolmogorov-Smirnov 5% Critical Value	0.197	95% BCA Bootstrap UCL	4.446
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.62
		97.5% Chebyshev(Mean, Sd) UCL	6.333
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.734
95% Approximate Gamma UCL	5.603		
95% Adjusted Gamma UCL	5.76		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	5.62
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	0.026	Minimum of Log Data	-3.65
Maximum	16.51	Maximum of Log Data	2.804
Mean	8.698	Mean of log Data	1.279
Median	10	SD of log Data	2.261
SD	4.73		
Coefficient of Variation	0.544		
Skewness	-1.047		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.734	Shapiro Wilk Test Statistic	0.562
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.53	95% H-UCL	552.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	121.4
95% Adjusted-CLT UCL (Chen-1995)	10.17	97.5% Chebyshev (MVUE) UCL	159.8
95% Modified-t UCL (Johnson-1978)	10.49	99% Chebyshev (MVUE) UCL	235.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.616	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.11		
MLE of Mean	8.698		
MLE of Standard Deviation	11.08		
nu star	24.65		
Approximate Chi Square Value (.05)	14.35	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	10.44
Adjusted Chi Square Value	13.73	95% Jackknife UCL	10.53
		95% Standard Bootstrap UCL	10.41
Anderson-Darling Test Statistic	4.68	95% Bootstrap-t UCL	10.24
Anderson-Darling 5% Critical Value	0.785	95% Hall's Bootstrap UCL	10.17
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	10.33
Kolmogorov-Smirnov 5% Critical Value	0.202	95% BCA Bootstrap UCL	10.18
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.31
		97.5% Chebyshev(Mean, Sd) UCL	15.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.22
95% Approximate Gamma UCL	14.95		
95% Adjusted Gamma UCL	15.62		

Potential UCL to Use	Use 97.5% Chebyshev (Mean, Sd) UCL	15.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	0.41	Maximum of Log Data	-0.892
Mean	0.266	Mean of log Data	-1.354
Median	0.266	SD of log Data	0.262
SD	0.0623		
Coefficient of Variation	0.234		
Skewness	0.173		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.667	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.29	95% H-UCL	0.298
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.336
95% Adjusted-CLT UCL (Chen-1995)	0.289	97.5% Chebyshev (MVUE) UCL	0.365
95% Modified-t UCL (Johnson-1978)	0.29	99% Chebyshev (MVUE) UCL	0.424
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.57	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0183		
MLE of Mean	0.266		
MLE of Standard Deviation	0.0697		
nu star	582.9		
Approximate Chi Square Value (.05)	527.9	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	0.289
Adjusted Chi Square Value	523.8	95% Jackknife UCL	0.29
		95% Standard Bootstrap UCL	0.288
Anderson-Darling Test Statistic	3.714	95% Bootstrap-t UCL	0.291
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	0.302
Kolmogorov-Smirnov Test Statistic	0.382	95% Percentile Bootstrap UCL	0.288
Kolmogorov-Smirnov 5% Critical Value	0.194	95% BCA Bootstrap UCL	0.288
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.327
		97.5% Chebyshev(Mean, Sd) UCL	0.353
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.405
95% Approximate Gamma UCL	0.294		
95% Adjusted Gamma UCL	0.296		
Potential UCL to Use		Use 95% Student's-t UCL	0.29
		or 95% Modified-t UCL	0.29

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0384	Minimum of Log Data	-3.26
Maximum	2.5	Maximum of Log Data	0.916
Mean	1.269	Mean of log Data	0.0974
Median	1.269	SD of log Data	0.805
SD	0.399		
Coefficient of Variation	0.315		
Skewness	-4.49E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.318
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.424	95% H-UCL	2.357
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.762
95% Adjusted-CLT UCL (Chen-1995)	1.416	97.5% Chebyshev (MVUE) UCL	3.312
95% Modified-t UCL (Johnson-1978)	1.424	99% Chebyshev (MVUE) UCL	4.391

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.182	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.399		
MLE of Mean	1.269		
MLE of Standard Deviation	0.712		
nu star	127.3		
Approximate Chi Square Value (.05)	102.2	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	1.416
Adjusted Chi Square Value	100.4	95% Jackknife UCL	1.424
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	6.099	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.519	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.658
		97.5% Chebyshev(Mean, Sd) UCL	1.827
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.158
95% Approximate Gamma UCL	1.58		
95% Adjusted Gamma UCL	1.608		

Potential UCL to Use		
	Use 95% Chebyshev (Mean, Sd) UCL	1.658

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options
From File 138-01.wst
Full Precision OFF
Confidence Coefficient 95%
Number of Bootstrap Operations 2000

Antimony

General Statistics
Number of Valid Observations 27 Number of Distinct Observations 4

Raw Statistics		Log-transformed Statistics	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	7.34	Maximum of Log Data	1.993
Mean	4.302	Mean of log Data	1.33
Median	4.302	SD of log Data	0.704
SD	1.301		
Coefficient of Variation	0.303		
Skewness	-1.771		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.614	Shapiro Wilk Test Statistic	0.415
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.729	95% H-UCL	6.528
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.839
95% Adjusted-CLT UCL (Chen-1995)	4.623	97.5% Chebyshev (MVUE) UCL	9.159
95% Modified-t UCL (Johnson-1978)	4.715	99% Chebyshev (MVUE) UCL	11.75

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.606	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.193		
MLE of Mean	4.302		
MLE of Standard Deviation	2.266		
nu star	194.7		
Approximate Chi Square Value (.05)	163.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	4.714
Adjusted Chi Square Value	161.6	95% Jackknife UCL	4.729
		95% Standard Bootstrap UCL	4.697
Anderson-Darling Test Statistic	6.486	95% Bootstrap-t UCL	4.661
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	4.654
Kolmogorov-Smirnov Test Statistic	0.492	95% Percentile Bootstrap UCL	4.682
Kolmogorov-Smirnov 5% Critical Value	0.169	95% BCA Bootstrap UCL	4.613
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.394
		97.5% Chebyshev(Mean, Sd) UCL	5.866
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.794
95% Approximate Gamma UCL	5.126		
95% Adjusted Gamma UCL	5.184		

Potential UCL to Use Use 95% Chebyshev (Mean, Sd) UCL 5.394

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	27	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	5.8	Minimum of Log Data	1.758
Maximum	15.45	Maximum of Log Data	2.738
Mean	9.9	Mean of log Data	2.267
Median	11	SD of log Data	0.238
SD	2.203		
Coefficient of Variation	0.223		
Skewness	-0.07		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.881
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.62	95% H-UCL	10.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.91
95% Adjusted-CLT UCL (Chen-1995)	10.59	97.5% Chebyshev (MVUE) UCL	12.77
95% Modified-t UCL (Johnson-1978)	10.62	99% Chebyshev (MVUE) UCL	14.47

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.34	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.571		
MLE of Mean	9.9		
MLE of Standard Deviation	2.377		
nu star	936.3		
Approximate Chi Square Value (.05)	866.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	10.6
Adjusted Chi Square Value	861.9	95% Jackknife UCL	10.62
		95% Standard Bootstrap UCL	10.59
Anderson-Darling Test Statistic	1.592	95% Bootstrap-t UCL	10.6
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	10.6
Kolmogorov-Smirnov Test Statistic	0.228	95% Percentile Bootstrap UCL	10.57
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	10.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.75
		97.5% Chebyshev(Mean, Sd) UCL	12.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.12
95% Approximate Gamma UCL	10.7		
95% Adjusted Gamma UCL	10.75		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.62
	or 95% Modified-t UCL	10.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.082	Minimum of Log Data	-2.501
Maximum	7.3	Maximum of Log Data	1.988
Mean	4.318	Mean of log Data	1.298
Median	4.318	SD of log Data	0.873
SD	1.314		
Coefficient of Variation	0.304		
Skewness	-1.852		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.398
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.749	95% H-UCL	8.031
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.552
95% Adjusted-CLT UCL (Chen-1995)	4.638	97.5% Chebyshev (MVUE) UCL	11.41
95% Modified-t UCL (Johnson-1978)	4.734	99% Chebyshev (MVUE) UCL	15.06

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.856	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.512		
MLE of Mean	4.318		
MLE of Standard Deviation	2.555		
nu star	154.2		
Approximate Chi Square Value (.05)	126.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	4.734
Adjusted Chi Square Value	124.9	95% Jackknife UCL	4.749
		95% Standard Bootstrap UCL	4.727
Anderson-Darling Test Statistic	6.535	95% Bootstrap-t UCL	4.665
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	4.681
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	4.701
Kolmogorov-Smirnov 5% Critical Value	0.169	95% BCA Bootstrap UCL	4.661
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.42
		97.5% Chebyshev(Mean, Sd) UCL	5.897
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.834
95% Approximate Gamma UCL	5.264		
95% Adjusted Gamma UCL	5.331		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	5.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	85	Maximum of Log Data	4.443
Mean	54.68	Mean of log Data	3.782
Median	44.6	SD of log Data	0.775
SD	29.65		
Coefficient of Variation	0.542		
Skewness	-0.177		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.815	Shapiro Wilk Test Statistic	0.821
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.41	95% H-UCL	83.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.95
95% Adjusted-CLT UCL (Chen-1995)	63.86	97.5% Chebyshev (MVUE) UCL	117.9
95% Modified-t UCL (Johnson-1978)	64.38	99% Chebyshev (MVUE) UCL	153.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.185	Data do not follow a Discernable Distribution (0.05)	
Theta Star	25.03		
MLE of Mean	54.68		
MLE of Standard Deviation	36.99		
nu star	118		
Approximate Chi Square Value (.05)	93.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	64.07
Adjusted Chi Square Value	92.53	95% Jackknife UCL	64.41
		95% Standard Bootstrap UCL	63.82
Anderson-Darling Test Statistic	1.71	95% Bootstrap-t UCL	64.55
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	63.57
Kolmogorov-Smirnov Test Statistic	0.273	95% Percentile Bootstrap UCL	63.82
Kolmogorov-Smirnov 5% Critical Value	0.17	95% BCA Bootstrap UCL	63.31
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.55
		97.5% Chebyshev(Mean, Sd) UCL	90.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111.5
95% Approximate Gamma UCL	68.7		
95% Adjusted Gamma UCL	69.72		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	79.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.0299	Minimum of Log Data	-3.51
Maximum	21.3	Maximum of Log Data	3.059
Mean	9.408	Mean of log Data	1.976
Median	10	SD of log Data	1.194
SD	4.271		
Coefficient of Variation	0.454		
Skewness	0.503		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.769	Shapiro Wilk Test Statistic	0.482
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.81	95% H-UCL	28.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.82
95% Adjusted-CLT UCL (Chen-1995)	10.84	97.5% Chebyshev (MVUE) UCL	38.06
95% Modified-t UCL (Johnson-1978)	10.82	99% Chebyshev (MVUE) UCL	52.27

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.832	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.135		
MLE of Mean	9.408		
MLE of Standard Deviation	6.951		
nu star	98.93		
Approximate Chi Square Value (.05)	76.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	10.76
Adjusted Chi Square Value	75.75	95% Jackknife UCL	10.81
		95% Standard Bootstrap UCL	10.75
Anderson-Darling Test Statistic	4.235	95% Bootstrap-t UCL	10.91
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	11.15
Kolmogorov-Smirnov Test Statistic	0.367	95% Percentile Bootstrap UCL	10.83
Kolmogorov-Smirnov 5% Critical Value	0.17	95% BCA Bootstrap UCL	10.75
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.99
		97.5% Chebyshev(Mean, Sd) UCL	14.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.59
95% Approximate Gamma UCL	12.09		
95% Adjusted Gamma UCL	12.29		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	101.7	Maximum of Log Data	4.622
Mean	46.55	Mean of log Data	3.517
Median	65	SD of log Data	0.953
SD	28.4		
Coefficient of Variation	0.61		
Skewness	-0.333		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.749	Shapiro Wilk Test Statistic	0.75
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	55.87	95% H-UCL	83.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.66
95% Adjusted-CLT UCL (Chen-1995)	55.16	97.5% Chebyshev (MVUE) UCL	118.9
95% Modified-t UCL (Johnson-1978)	55.81	99% Chebyshev (MVUE) UCL	158.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.528	Data do not follow a Discernable Distribution (0.05)	
Theta Star	30.46		
MLE of Mean	46.55		
MLE of Standard Deviation	37.65		
nu star	82.53		
Approximate Chi Square Value (.05)	62.59	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	55.54
Adjusted Chi Square Value	61.48	95% Jackknife UCL	55.87
		95% Standard Bootstrap UCL	55.43
Anderson-Darling Test Statistic	3.548	95% Bootstrap-t UCL	55.72
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	54.59
Kolmogorov-Smirnov Test Statistic	0.391	95% Percentile Bootstrap UCL	55.26
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	55.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	70.37
		97.5% Chebyshev(Mean, Sd) UCL	80.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	100.9
95% Approximate Gamma UCL	61.37		
95% Adjusted Gamma UCL	62.48		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	70.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	5	Maximum of Log Data	1.609
Mean	1.408	Mean of log Data	-0.236
Median	1.408	SD of log Data	1.271
SD	1.412		
Coefficient of Variation	1.003		
Skewness	1.812		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.676	Shapiro Wilk Test Statistic	0.79
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.872	95% H-UCL	3.643
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.84
95% Adjusted-CLT UCL (Chen-1995)	1.957	97.5% Chebyshev (MVUE) UCL	4.773
95% Modified-t UCL (Johnson-1978)	1.888	99% Chebyshev (MVUE) UCL	6.605

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.912	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.545		
MLE of Mean	1.408		
MLE of Standard Deviation	1.475		
nu star	49.23		
Approximate Chi Square Value (.05)	34.12	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	1.855
Adjusted Chi Square Value	33.32	95% Jackknife UCL	1.872
		95% Standard Bootstrap UCL	1.848
Anderson-Darling Test Statistic	2.29	95% Bootstrap-t UCL	2.06
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	1.954
Kolmogorov-Smirnov Test Statistic	0.299	95% Percentile Bootstrap UCL	1.878
Kolmogorov-Smirnov 5% Critical Value	0.173	95% BCA Bootstrap UCL	1.912
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.593
		97.5% Chebyshev(Mean, Sd) UCL	3.105
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.112
95% Approximate Gamma UCL	2.032		
95% Adjusted Gamma UCL	2.081		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	2.593

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.049	Minimum of Log Data	-3.016
Maximum	10.09	Maximum of Log Data	2.312
Mean	7.976	Mean of log Data	1.783
Median	10	SD of log Data	1.229
SD	3.158		
Coefficient of Variation	0.396		
Skewness	-1.32		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.661	Shapiro Wilk Test Statistic	0.468
Shapiro Wilk Critical Value	0.923	Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.012	95% H-UCL	25.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.97
95% Adjusted-CLT UCL (Chen-1995)	8.811	97.5% Chebyshev (MVUE) UCL	33.4
95% Modified-t UCL (Johnson-1978)	8.987	99% Chebyshev (MVUE) UCL	46.04

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.673	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.768		
MLE of Mean	7.976		
MLE of Standard Deviation	6.167		
nu star	90.33		
Approximate Chi Square Value (.05)	69.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0401	95% CLT UCL	8.975
Adjusted Chi Square Value	68.25	95% Jackknife UCL	9.012
		95% Standard Bootstrap UCL	8.967
Anderson-Darling Test Statistic	5.083	95% Bootstrap-t UCL	8.903
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	8.82
Kolmogorov-Smirnov Test Statistic	0.38	95% Percentile Bootstrap UCL	8.896
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	8.896
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.62
		97.5% Chebyshev(Mean, Sd) UCL	11.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.02
95% Approximate Gamma UCL	10.38		
95% Adjusted Gamma UCL	10.56		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	10.62
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	27	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	138-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nickel

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	113.2	Maximum of Log Data	4.729
Mean	73.68	Mean of log Data	4.281
Median	65	SD of log Data	0.19
SD	15.95		
Coefficient of Variation	0.217		
Skewness	1.707		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.611	Shapiro Wilk Test Statistic	0.621
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	79.85	95% H-UCL	79.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	87.28
95% Adjusted-CLT UCL (Chen-1995)	81.01	97.5% Chebyshev (MVUE) UCL	93.21
95% Modified-t UCL (Johnson-1978)	80.08	99% Chebyshev (MVUE) UCL	104.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	22.85	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.224		
MLE of Mean	73.68		
MLE of Standard Deviation	15.41		
nu star	914		
Approximate Chi Square Value (.05)	844.9	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	79.55
Adjusted Chi Square Value	839.6	95% Jackknife UCL	79.85
		95% Standard Bootstrap UCL	79.38
Anderson-Darling Test Statistic	3.688	95% Bootstrap-t UCL	82.28
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	79.15
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	79.86
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	80.44
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	89.23
		97.5% Chebyshev(Mean, Sd) UCL	95.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.2
95% Approximate Gamma UCL	79.72		
95% Adjusted Gamma UCL	80.21		

Potential UCL to Use		
	Use 95% Student's-t UCL	79.85
	or 95% Modified-t UCL	80.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.092	Minimum of Log Data	-2.386
Maximum	5	Maximum of Log Data	1.609
Mean	4.302	Mean of log Data	1.186
Median	5	SD of log Data	1.154
SD	1.467		
Coefficient of Variation	0.341		
Skewness	-2.642		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.504	Shapiro Wilk Test Statistic	0.4
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.87	95% H-UCL	13.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.85
95% Adjusted-CLT UCL (Chen-1995)	4.635	97.5% Chebyshev (MVUE) UCL	17.22
95% Modified-t UCL (Johnson-1978)	4.837	99% Chebyshev (MVUE) UCL	23.84

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.716	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.507		
MLE of Mean	4.302		
MLE of Standard Deviation	3.284		
nu star	68.64		
Approximate Chi Square Value (.05)	50.57	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	4.842
Adjusted Chi Square Value	49.35	95% Jackknife UCL	4.87
		95% Standard Bootstrap UCL	4.81
Anderson-Darling Test Statistic	5.655	95% Bootstrap-t UCL	4.706
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	4.691
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	4.791
Kolmogorov-Smirnov 5% Critical Value	0.196	95% BCA Bootstrap UCL	4.686
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.732
		97.5% Chebyshev(Mean, Sd) UCL	6.351
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.566
95% Approximate Gamma UCL	5.84		
95% Adjusted Gamma UCL	5.985		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.732

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Silver

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	12.67	Maximum of Log Data	2.539
Mean	10.2	Mean of log Data	2.32
Median	10	SD of log Data	0.0562
SD	0.628		
Coefficient of Variation	0.0616		
Skewness	3.686		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.363	Shapiro Wilk Test Statistic	0.37
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	10.44	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		10.75
95% Adjusted-CLT UCL (Chen-1995)	10.55	97.5% Chebyshev (MVUE) UCL		11
95% Modified-t UCL (Johnson-1978)	10.46	99% Chebyshev (MVUE) UCL		11.47

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	266.6	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0382		
MLE of Mean	10.2		
MLE of Standard Deviation	0.624		
nu star	10663		
Approximate Chi Square Value (.05)	10424	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	10.43
Adjusted Chi Square Value	10405	95% Jackknife UCL	10.44
		95% Standard Bootstrap UCL	10.42
Anderson-Darling Test Statistic	5.792	95% Bootstrap-t UCL	12.03
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	13.26
Kolmogorov-Smirnov Test Statistic	0.477	95% Percentile Bootstrap UCL	10.46
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	10.53
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.81
		97.5% Chebyshev(Mean, Sd) UCL	11.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.59
95% Approximate Gamma UCL	10.43		
95% Adjusted Gamma UCL	10.45		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.44
	or 95% Modified-t UCL	10.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics

Number of Valid Observations	20	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0384	Minimum of Log Data	-3.26
Maximum	2.5	Maximum of Log Data	0.916
Mean	1.269	Mean of log Data	0.0974
Median	1.269	SD of log Data	0.805
SD	0.399		
Coefficient of Variation	0.315		
Skewness	#######		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.318
Shapiro Wilk Critical Value	0.905	Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.424	95% H-UCL	2.357
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.762
95% Adjusted-CLT UCL (Chen-1995)	1.416	97.5% Chebyshev (MVUE) UCL	3.312
95% Modified-t UCL (Johnson-1978)	1.424	99% Chebyshev (MVUE) UCL	4.391

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.182	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.399		
MLE of Mean	1.269		
MLE of Standard Deviation	0.712		
nu star	127.3		
Approximate Chi Square Value (.05)	102.2	Nonparametric Statistics	
Adjusted Level of Significance	0.038	95% CLT UCL	1.416
Adjusted Chi Square Value	100.4	95% Jackknife UCL	1.424
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	6.099	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.519	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.658
		97.5% Chebyshev(Mean, Sd) UCL	1.827
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.158
95% Approximate Gamma UCL	1.58		
95% Adjusted Gamma UCL	1.608		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	1.658

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	180-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.4	Minimum of Log Data	-0.916
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.56	Mean of log Data	-0.587
Median	0.56	SD of log Data	0.128
SD	0.0675		
Coefficient of Variation	0.121		
Skewness	-0.533		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.669	Shapiro Wilk Test Statistic	0.646
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.597	95% H-UCL	0.603
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.655
95% Adjusted-CLT UCL (Chen-1995)	0.59	97.5% Chebyshev (MVUE) UCL	0.695
95% Modified-t UCL (Johnson-1978)	0.596	99% Chebyshev (MVUE) UCL	0.776

Gamma Distribution Test		Data Distribution
k star (bias corrected)	51.31	Data do not follow a Discernable Distribution (0.05)
Theta Star	0.0109	
MLE of Mean	0.56	
MLE of Standard Deviation	0.0782	
nu star	1129	
Approximate Chi Square Value (.05)	1052	Nonparametric Statistics
Adjusted Level of Significance	0.0278	95% CLT UCL 0.593
Adjusted Chi Square Value	1040	95% Jackknife UCL 0.597
		95% Standard Bootstrap UCL 0.591
Anderson-Darling Test Statistic	2.102	95% Bootstrap-t UCL 0.59
Anderson-Darling 5% Critical Value	0.727	95% Hall's Bootstrap UCL 0.598
Kolmogorov-Smirnov Test Statistic	0.425	95% Percentile Bootstrap UCL 0.589
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL 0.585
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 0.649
		97.5% Chebyshev(Mean, Sd) UCL 0.687
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 0.763
95% Approximate Gamma UCL	0.601	
95% Adjusted Gamma UCL	0.608	

Potential UCL to Use		
	Use 95% Student's-t UCL	0.597
	or 95% Modified-t UCL	0.596

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	5.72	Minimum of Log Data	1.744
Maximum	138	Maximum of Log Data	4.927
Mean	25.31	Mean of log Data	2.72
Median	11.3	SD of log Data	0.89
SD	38.35		
Coefficient of Variation	1.515		
Skewness	3.036		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.519	Shapiro Wilk Test Statistic	0.831
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	46.27	95% H-UCL	49.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.03
95% Adjusted-CLT UCL (Chen-1995)	55.64	97.5% Chebyshev (MVUE) UCL	59.49
95% Modified-t UCL (Johnson-1978)	48.03	99% Chebyshev (MVUE) UCL	82.01

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.871	Data do not follow a Discernable Distribution (0.05)	
Theta Star	29.06		
MLE of Mean	25.31		
MLE of Standard Deviation	27.12		
nu star	19.16		
Approximate Chi Square Value (.05)	10.24	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	44.33
Adjusted Chi Square Value	9.192	95% Jackknife UCL	46.27
		95% Standard Bootstrap UCL	44.04
Anderson-Darling Test Statistic	1.348	95% Bootstrap-t UCL	142.5
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	114.9
Kolmogorov-Smirnov Test Statistic	0.328	95% Percentile Bootstrap UCL	47
Kolmogorov-Smirnov 5% Critical Value	0.262	95% BCA Bootstrap UCL	59.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.71
		97.5% Chebyshev(Mean, Sd) UCL	97.52
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	140.4
95% Approximate Gamma UCL	47.39		
95% Adjusted Gamma UCL	52.78		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	75.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.54	Minimum of Log Data	-0.616
Maximum	0.69	Maximum of Log Data	-0.371
Mean	0.607	Mean of log Data	-0.501
Median	0.607	SD of log Data	0.0556
SD	0.0342		
Coefficient of Variation	0.0563		
Skewness	0.852		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.687	Shapiro Wilk Test Statistic	0.695
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.625	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.651
95% Adjusted-CLT UCL (Chen-1995)	0.626	97.5% Chebyshev (MVUE) UCL	0.67
95% Modified-t UCL (Johnson-1978)	0.626	99% Chebyshev (MVUE) UCL	0.708

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	257.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0024		
MLE of Mean	0.607		
MLE of Standard Deviation	0.0378		
nu star	5661		
Approximate Chi Square Value (.05)	5487	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	0.624
Adjusted Chi Square Value	5459	95% Jackknife UCL	0.625
		95% Standard Bootstrap UCL	0.623
Anderson-Darling Test Statistic	1.904	95% Bootstrap-t UCL	0.627
Anderson-Darling 5% Critical Value	0.726	95% Hall's Bootstrap UCL	0.646
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	0.622
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	0.628
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.652
		97.5% Chebyshev(Mean, Sd) UCL	0.671
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.709
95% Approximate Gamma UCL	0.626		
95% Adjusted Gamma UCL	0.629		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.625
	or 95% Modified-t UCL	0.626

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	37.92	Minimum of Log Data	3.635
Maximum	85	Maximum of Log Data	4.443
Mean	64.11	Mean of log Data	4.125
Median	58.52	SD of log Data	0.283
SD	17.74		
Coefficient of Variation	0.277		
Skewness	0.191		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.853	Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.8	95% H-UCL	76.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88.17
95% Adjusted-CLT UCL (Chen-1995)	73.24	97.5% Chebyshev (MVUE) UCL	98.57
95% Modified-t UCL (Johnson-1978)	73.85	99% Chebyshev (MVUE) UCL	119

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.34	Data appear Normal at 5% Significance Level	
Theta Star	6.201		
MLE of Mean	64.11		
MLE of Standard Deviation	19.94		
nu star	227.4		
Approximate Chi Square Value (.05)	193.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	72.91
Adjusted Chi Square Value	188.4	95% Jackknife UCL	73.8
		95% Standard Bootstrap UCL	72.69
Anderson-Darling Test Statistic	0.661	95% Bootstrap-t UCL	74.27
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	72.06
Kolmogorov-Smirnov Test Statistic	0.248	95% Percentile Bootstrap UCL	73.02
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	72.73
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.42
		97.5% Chebyshev(Mean, Sd) UCL	97.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117.3
95% Approximate Gamma UCL	75.34		
95% Adjusted Gamma UCL	77.38		

Potential UCL to Use		Use 95% Student's-t UCL	73.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	8	Minimum of Log Data	2.079
Maximum	19.6	Maximum of Log Data	2.976
Mean	12.13	Mean of log Data	2.472
Median	12.13	SD of log Data	0.224
SD	2.897		
Coefficient of Variation	0.239		
Skewness	1.551		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.688	Shapiro Wilk Test Statistic	0.739
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.72	95% H-UCL	13.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.71
95% Adjusted-CLT UCL (Chen-1995)	14.01	97.5% Chebyshev (MVUE) UCL	17.26
95% Modified-t UCL (Johnson-1978)	13.78	99% Chebyshev (MVUE) UCL	20.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.68	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.774		
MLE of Mean	12.13		
MLE of Standard Deviation	3.065		
nu star	344.9		
Approximate Chi Square Value (.05)	302.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	13.57
Adjusted Chi Square Value	296.4	95% Jackknife UCL	13.72
		95% Standard Bootstrap UCL	13.5
Anderson-Darling Test Statistic	1.693	95% Bootstrap-t UCL	14.2
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	21.01
Kolmogorov-Smirnov Test Statistic	0.38	95% Percentile Bootstrap UCL	13.49
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	13.87
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.94
		97.5% Chebyshev(Mean, Sd) UCL	17.59
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.83
95% Approximate Gamma UCL	13.82		
95% Adjusted Gamma UCL	14.12		

Potential UCL to Use		
	Use 95% Student's-t UCL	13.72
	or 95% Modified-t UCL	13.78

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	18.3	Minimum of Log Data	2.907
Maximum	1992	Maximum of Log Data	7.597
Mean	305.4	Mean of log Data	4.371
Median	43.19	SD of log Data	1.587
SD	601.9		
Coefficient of Variation	1.971		
Skewness	2.655		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.558	Shapiro Wilk Test Statistic	0.844
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	634.3	95% H-UCL	2324
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	736.9
95% Adjusted-CLT UCL (Chen-1995)	759.2	97.5% Chebyshev (MVUE) UCL	957.4
95% Modified-t UCL (Johnson-1978)	658.6	99% Chebyshev (MVUE) UCL	1391

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.405	Data do not follow a Discernable Distribution (0.05)	
Theta Star	753.3		
MLE of Mean	305.4		
MLE of Standard Deviation	479.6		
nu star	8.919		
Approximate Chi Square Value (.05)	3.278	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	603.9
Adjusted Chi Square Value	2.745	95% Jackknife UCL	634.3
		95% Standard Bootstrap UCL	587.8
Anderson-Darling Test Statistic	1.226	95% Bootstrap-t UCL	2114
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	2234
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	627.7
Kolmogorov-Smirnov 5% Critical Value	0.27	95% BCA Bootstrap UCL	815.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1097
		97.5% Chebyshev(Mean, Sd) UCL	1439
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2111
95% Approximate Gamma UCL	830.9		
95% Adjusted Gamma UCL	992.2		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2111
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	259.9	Minimum of Log Data	5.56
Maximum	1332	Maximum of Log Data	7.194
Mean	641.2	Mean of log Data	6.349
Median	535.7	SD of log Data	0.496
SD	333.9		
Coefficient of Variation	0.521		
Skewness	1.096		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	823.7	95% H-UCL	909.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1064
95% Adjusted-CLT UCL (Chen-1995)	842.4	97.5% Chebyshev (MVUE) UCL	1248
95% Modified-t UCL (Johnson-1978)	829.3	99% Chebyshev (MVUE) UCL	1610

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.365	Data appear Normal at 5% Significance Level	
Theta Star	190.6		
MLE of Mean	641.2		
MLE of Standard Deviation	349.6		
nu star	74.02		
Approximate Chi Square Value (.05)	55.21	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	806.8
Adjusted Chi Square Value	52.57	95% Jackknife UCL	823.7
		95% Standard Bootstrap UCL	799.5
Anderson-Darling Test Statistic	0.302	95% Bootstrap-t UCL	902.9
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	913.1
Kolmogorov-Smirnov Test Statistic	0.181	95% Percentile Bootstrap UCL	805.6
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	826.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1080
		97.5% Chebyshev(Mean, Sd) UCL	1270
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1643
95% Approximate Gamma UCL	859.8		
95% Adjusted Gamma UCL	903		

Potential UCL to Use		Use 95% Student's-t UCL	823.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0288	Minimum of Log Data	-3.547
Maximum	10	Maximum of Log Data	2.303
Mean	6.816	Mean of log Data	0.736
Median	10	SD of log Data	2.558
SD	4.481		
Coefficient of Variation	0.657		
Skewness	-1		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.687	Shapiro Wilk Test Statistic	0.618
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.264	95% H-UCL	10164
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	109.3
95% Adjusted-CLT UCL (Chen-1995)	8.602	97.5% Chebyshev (MVUE) UCL	145.7
95% Modified-t UCL (Johnson-1978)	9.196	99% Chebyshev (MVUE) UCL	217.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.447	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.23		
MLE of Mean	6.816		
MLE of Standard Deviation	10.19		
nu star	9.844		
Approximate Chi Square Value (.05)	3.844	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	9.038
Adjusted Chi Square Value	3.257	95% Jackknife UCL	9.264
		95% Standard Bootstrap UCL	8.924
Anderson-Darling Test Statistic	2.299	95% Bootstrap-t UCL	8.878
Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	8.48
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	8.783
Kolmogorov-Smirnov 5% Critical Value	0.269	95% BCA Bootstrap UCL	8.471
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.7
		97.5% Chebyshev(Mean, Sd) UCL	15.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.26
95% Approximate Gamma UCL	17.45		
95% Adjusted Gamma UCL	20.6		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.26
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	12.2	Minimum of Log Data	2.501
Maximum	90.33	Maximum of Log Data	4.503
Mean	60.6	Mean of log Data	3.945
Median	66.3	SD of log Data	0.704
SD	25.44		
Coefficient of Variation	0.42		
Skewness	-1.319		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.813	Shapiro Wilk Test Statistic	0.666
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.5	95% H-UCL	114.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	126.4
95% Adjusted-CLT UCL (Chen-1995)	69.96	97.5% Chebyshev (MVUE) UCL	153.1
95% Modified-t UCL (Johnson-1978)	73.99	99% Chebyshev (MVUE) UCL	205.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.465	Data do not follow a Discernable Distribution (0.05)	
Theta Star	24.58		
MLE of Mean	60.6		
MLE of Standard Deviation	38.6		
nu star	54.23		
Approximate Chi Square Value (.05)	38.31	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	73.22
Adjusted Chi Square Value	36.14	95% Jackknife UCL	74.5
		95% Standard Bootstrap UCL	72.91
Anderson-Darling Test Statistic	1.577	95% Bootstrap-t UCL	71.89
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	70.39
Kolmogorov-Smirnov Test Statistic	0.35	95% Percentile Bootstrap UCL	71.87
Kolmogorov-Smirnov 5% Critical Value	0.257	95% BCA Bootstrap UCL	70.43
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.04
		97.5% Chebyshev(Mean, Sd) UCL	108.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	136.9
95% Approximate Gamma UCL	85.78		
95% Adjusted Gamma UCL	90.93		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	94.04

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	11.68	Maximum of Log Data	2.458
Mean	8.366	Mean of log Data	1.28
Median	10	SD of log Data	2.32
SD	4.15		
Coefficient of Variation	0.496		
Skewness	-1.853		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.571	Shapiro Wilk Test Statistic	0.501
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.63	95% H-UCL	4000
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.9
95% Adjusted-CLT UCL (Chen-1995)	9.677	97.5% Chebyshev (MVUE) UCL	160.5
95% Modified-t UCL (Johnson-1978)	10.52	99% Chebyshev (MVUE) UCL	238.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.58	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.42		
MLE of Mean	8.366		
MLE of Standard Deviation	10.98		
nu star	12.76		
Approximate Chi Square Value (.05)	5.732	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	10.42
Adjusted Chi Square Value	4.985	95% Jackknife UCL	10.63
		95% Standard Bootstrap UCL	10.38
Anderson-Darling Test Statistic	3.182	95% Bootstrap-t UCL	10.01
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	9.768
Kolmogorov-Smirnov Test Statistic	0.527	95% Percentile Bootstrap UCL	10.2
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	10.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.82
		97.5% Chebyshev(Mean, Sd) UCL	16.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.82
95% Approximate Gamma UCL	18.62		
95% Adjusted Gamma UCL	21.42		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.82
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.16	Minimum of Log Data	-1.833
Maximum	0.75	Maximum of Log Data	-0.288
Mean	0.397	Mean of log Data	-0.981
Median	0.397	SD of log Data	0.363
SD	0.139		
Coefficient of Variation	0.352		
Skewness	1.319		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.701	Shapiro Wilk Test Statistic	0.731
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.473	95% H-UCL	0.505
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.59
95% Adjusted-CLT UCL (Chen-1995)	0.484	97.5% Chebyshev (MVUE) UCL	0.673
95% Modified-t UCL (Johnson-1978)	0.476	99% Chebyshev (MVUE) UCL	0.836

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.639	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0597		
MLE of Mean	0.397		
MLE of Standard Deviation	0.154		
nu star	146.1		
Approximate Chi Square Value (.05)	119.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	0.466
Adjusted Chi Square Value	115.2	95% Jackknife UCL	0.473
		95% Standard Bootstrap UCL	0.463
Anderson-Darling Test Statistic	1.69	95% Bootstrap-t UCL	0.478
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	0.882
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	0.461
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	0.472
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.58
		97.5% Chebyshev(Mean, Sd) UCL	0.659
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.815
95% Approximate Gamma UCL	0.486		
95% Adjusted Gamma UCL	0.503		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.473
	or 95% Modified-t UCL	0.476

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	180-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.25	Minimum of Log Data	-1.386
Maximum	0.59	Maximum of Log Data	-0.528
Mean	0.42	Mean of log Data	-0.882
Median	0.42	SD of log Data	0.186
SD	0.073		
Coefficient of Variation	0.173		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.579
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.458	95% H-UCL	0.467
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.519
95% Adjusted-CLT UCL (Chen-1995)	0.454	97.5% Chebyshev (MVUE) UCL	0.562
95% Modified-t UCL (Johnson-1978)	0.458	99% Chebyshev (MVUE) UCL	0.646

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.33	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.017		
MLE of Mean	0.42		
MLE of Standard Deviation	0.084		
nu star	607.9		
Approximate Chi Square Value (.05)	551.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.454
Adjusted Chi Square Value	543.5	95% Jackknife UCL	0.458
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.741	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.511
		97.5% Chebyshev(Mean, Sd) UCL	0.551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.628
95% Approximate Gamma UCL	0.463		
95% Adjusted Gamma UCL	0.47		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.458
	or 95% Modified-t UCL	0.458

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	5.99	Minimum of Log Data	1.79
Maximum	18.65	Maximum of Log Data	2.926
Mean	9.747	Mean of log Data	2.226
Median	8.365	SD of log Data	0.32
SD	3.512		
Coefficient of Variation	0.36		
Skewness	1.594		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.852	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.57	95% H-UCL	11.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.67
95% Adjusted-CLT UCL (Chen-1995)	11.91	97.5% Chebyshev (MVUE) UCL	15.38
95% Modified-t UCL (Johnson-1978)	11.65	99% Chebyshev (MVUE) UCL	18.74

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.615	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.28		
MLE of Mean	9.747		
MLE of Standard Deviation	3.532		
nu star	182.8		
Approximate Chi Square Value (.05)	152.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.41
Adjusted Chi Square Value	148.3	95% Jackknife UCL	11.57
		95% Standard Bootstrap UCL	11.31
Anderson-Darling Test Statistic	0.429	95% Bootstrap-t UCL	12.69
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	19.25
Kolmogorov-Smirnov Test Statistic	0.192	95% Percentile Bootstrap UCL	11.42
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.77
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.17
		97.5% Chebyshev(Mean, Sd) UCL	16.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.84
95% Approximate Gamma UCL	11.68		
95% Adjusted Gamma UCL	12.01		

Potential UCL to Use		Use 95% Approximate Gamma UCL	11.68

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	36.22	Minimum of Log Data	3.59
Maximum	85	Maximum of Log Data	4.443
Mean	55.56	Mean of log Data	3.963
Median	52.15	SD of log Data	0.339
SD	19.57		
Coefficient of Variation	0.352		
Skewness	0.709		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.825	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.7	95% H-UCL	68.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.37
95% Adjusted-CLT UCL (Chen-1995)	66.08	97.5% Chebyshev (MVUE) UCL	89.71
95% Modified-t UCL (Johnson-1978)	65.89	99% Chebyshev (MVUE) UCL	110

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.129	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	7.792		
MLE of Mean	55.56		
MLE of Standard Deviation	20.81		
nu star	171.1		
Approximate Chi Square Value (.05)	141.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.85
Adjusted Chi Square Value	137.8	95% Jackknife UCL	65.7
		95% Standard Bootstrap UCL	64.23
Anderson-Darling Test Statistic	0.713	95% Bootstrap-t UCL	67.91
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	63.84
Kolmogorov-Smirnov Test Statistic	0.2	95% Percentile Bootstrap UCL	65.37
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	65.18
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.18
		97.5% Chebyshev(Mean, Sd) UCL	90.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111.8
95% Approximate Gamma UCL	67.01		
95% Adjusted Gamma UCL	68.99		

Potential UCL to Use	Use 95% Approximate Gamma UCL	67.01

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	77.89	Minimum of Log Data	4.355
Maximum	1649	Maximum of Log Data	7.408
Mean	400.8	Mean of log Data	5.598
Median	267.8	SD of log Data	0.893
SD	438.1		
Coefficient of Variation	1.093		
Skewness	2.426		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.707	Shapiro Wilk Test Statistic	0.971
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	627.9	95% H-UCL	837.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	844
95% Adjusted-CLT UCL (Chen-1995)	703.4	97.5% Chebyshev (MVUE) UCL	1043
95% Modified-t UCL (Johnson-1978)	642.7	99% Chebyshev (MVUE) UCL	1433

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.112	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	360.6		
MLE of Mean	400.8		
MLE of Standard Deviation	380.2		
nu star	26.68		
Approximate Chi Square Value (.05)	15.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	608.8
Adjusted Chi Square Value	14.65	95% Jackknife UCL	627.9
		95% Standard Bootstrap UCL	597.7
Anderson-Darling Test Statistic	0.383	95% Bootstrap-t UCL	976.3
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	1525
Kolmogorov-Smirnov Test Statistic	0.151	95% Percentile Bootstrap UCL	624.3
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	696.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	952
		97.5% Chebyshev(Mean, Sd) UCL	1191
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1659
95% Approximate Gamma UCL	672.4		
95% Adjusted Gamma UCL	730.1		

Potential UCL to Use	Use 95% Approximate Gamma UCL	672.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.023	Minimum of Log Data	-3.777
Maximum	10	Maximum of Log Data	2.303
Mean	9.023	Mean of log Data	1.78
Median	10	SD of log Data	1.751
SD	2.879		
Coefficient of Variation	0.319		
Skewness	-3.29		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.401	Shapiro Wilk Test Statistic	0.341
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.52	95% H-UCL	283.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.87
95% Adjusted-CLT UCL (Chen-1995)	9.545	97.5% Chebyshev (MVUE) UCL	95.15
95% Modified-t UCL (Johnson-1978)	10.38	99% Chebyshev (MVUE) UCL	138.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.055	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.549		
MLE of Mean	9.023		
MLE of Standard Deviation	8.783		
nu star	25.33		
Approximate Chi Square Value (.05)	14.86	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.39
Adjusted Chi Square Value	13.65	95% Jackknife UCL	10.52
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.12	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.64
		97.5% Chebyshev(Mean, Sd) UCL	14.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.29
95% Approximate Gamma UCL	15.38		
95% Adjusted Gamma UCL	16.74		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.29
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	10.7	Minimum of Log Data	2.37
Maximum	86.36	Maximum of Log Data	4.459
Mean	59.75	Mean of log Data	3.926
Median	65	SD of log Data	0.724
SD	24.69		
Coefficient of Variation	0.413		
Skewness	-1.34		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.629
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.55	95% H-UCL	112.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	125.4
95% Adjusted-CLT UCL (Chen-1995)	68.53	97.5% Chebyshev (MVUE) UCL	151.8
95% Modified-t UCL (Johnson-1978)	72.09	99% Chebyshev (MVUE) UCL	203.8

Gamma Distribution Test		Data Distribution
k star (bias corrected)	2.463	Data do not follow a Discernable Distribution (0.05)
Theta Star	24.26	
MLE of Mean	59.75	
MLE of Standard Deviation	38.08	
nu star	59.1	
Approximate Chi Square Value (.05)	42.43	Nonparametric Statistics
Adjusted Level of Significance	0.029	95% CLT UCL 71.47
Adjusted Chi Square Value	40.28	95% Jackknife UCL 72.55
		95% Standard Bootstrap UCL 71.22
Anderson-Darling Test Statistic	1.897	95% Bootstrap-t UCL 69.68
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL 69.01
Kolmogorov-Smirnov Test Statistic	0.39	95% Percentile Bootstrap UCL 70.23
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL 69.55
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 90.82
		97.5% Chebyshev(Mean, Sd) UCL 104.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 130.7
95% Approximate Gamma UCL	83.24	
95% Adjusted Gamma UCL	87.68	

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	90.82
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	180-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	7.14	Minimum of Log Data	1.966
Maximum	30.3	Maximum of Log Data	3.411
Mean	11.42	Mean of log Data	2.376
Median	11	SD of log Data	0.32
SD	5.156		
Coefficient of Variation	0.452		
Skewness	3.363		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.572	Shapiro Wilk Test Statistic	0.775
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.6	95% H-UCL	13.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.16
95% Adjusted-CLT UCL (Chen-1995)	14.57	97.5% Chebyshev (MVUE) UCL	16.83
95% Modified-t UCL (Johnson-1978)	13.77	99% Chebyshev (MVUE) UCL	20.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.116	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.605		
MLE of Mean	11.42		
MLE of Standard Deviation	4.281		
nu star	241.9		
Approximate Chi Square Value (.05)	206.9	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	13.48
Adjusted Chi Square Value	203.5	95% Jackknife UCL	13.6
		95% Standard Bootstrap UCL	13.41
Anderson-Darling Test Statistic	1.613	95% Bootstrap-t UCL	16.29
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	22.32
Kolmogorov-Smirnov Test Statistic	0.263	95% Percentile Bootstrap UCL	13.84
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	14.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.87
		97.5% Chebyshev(Mean, Sd) UCL	19.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.86
95% Approximate Gamma UCL	13.35		
95% Adjusted Gamma UCL	13.57		

Potential UCL to Use		
	Use 95% Student's-t UCL	13.6
	or 95% Modified-t UCL	13.77

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.22	Minimum of Log Data	-1.514
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.467	Mean of log Data	-0.781
Median	0.467	SD of log Data	0.213
SD	0.085		
Coefficient of Variation	0.182		
Skewness	-0.27		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.511	Shapiro Wilk Test Statistic	0.471
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.503	95% H-UCL	0.516
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.574
95% Adjusted-CLT UCL (Chen-1995)	0.499	97.5% Chebyshev (MVUE) UCL	0.62
95% Modified-t UCL (Johnson-1978)	0.502	99% Chebyshev (MVUE) UCL	0.71

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	22.16	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.021		
MLE of Mean	0.467		
MLE of Standard Deviation	0.099		
nu star	753.6		
Approximate Chi Square Value (.05)	690.9	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	0.501
Adjusted Chi Square Value	684.6	95% Jackknife UCL	0.503
		95% Standard Bootstrap UCL	0.5
Anderson-Darling Test Statistic	4.426	95% Bootstrap-t UCL	0.497
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.507
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	0.496
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	0.495
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.556
		97.5% Chebyshev(Mean, Sd) UCL	0.595
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.672
95% Approximate Gamma UCL	0.509		
95% Adjusted Gamma UCL	0.514		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.503
	or 95% Modified-t UCL	0.502

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	17	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	7.7	Minimum of Log Data	2.041
Maximum	85	Maximum of Log Data	4.443
Mean	58.02	Mean of log Data	3.949
Median	49.42	SD of log Data	0.575
SD	22.79		
Coefficient of Variation	0.393		
Skewness	-0.17		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.832	Shapiro Wilk Test Statistic	0.7
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.67	95% H-UCL	82.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.9
95% Adjusted-CLT UCL (Chen-1995)	66.87	97.5% Chebyshev (MVUE) UCL	115.5
95% Modified-t UCL (Johnson-1978)	67.63	99% Chebyshev (MVUE) UCL	148.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.851	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.07		
MLE of Mean	58.02		
MLE of Standard Deviation	29.57		
nu star	130.9		
Approximate Chi Square Value (.05)	105.5	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	67.12
Adjusted Chi Square Value	103.1	95% Jackknife UCL	67.67
		95% Standard Bootstrap UCL	66.88
Anderson-Darling Test Statistic	1.304	95% Bootstrap-t UCL	67.6
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	66.47
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	66.76
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	66.92
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.12
		97.5% Chebyshev(Mean, Sd) UCL	92.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	113
95% Approximate Gamma UCL	72.01		
95% Adjusted Gamma UCL	73.68		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	82.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	149.8	Minimum of Log Data	5.009
Maximum	1002	Maximum of Log Data	6.91
Mean	410.2	Mean of log Data	5.9
Median	343	SD of log Data	0.495
SD	215.5		
Coefficient of Variation	0.525		
Skewness	1.37		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.889	Shapiro Wilk Test Statistic	0.987
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	501.5	95% H-UCL	530.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	630.2
95% Adjusted-CLT UCL (Chen-1995)	514.8	97.5% Chebyshev (MVUE) UCL	725.8
95% Modified-t UCL (Johnson-1978)	504.4	99% Chebyshev (MVUE) UCL	913.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.686	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	111.3		
MLE of Mean	410.2		
MLE of Standard Deviation	213.7		
nu star	125.3		
Approximate Chi Square Value (.05)	100.5	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	496.2
Adjusted Chi Square Value	98.13	95% Jackknife UCL	501.5
		95% Standard Bootstrap UCL	495
Anderson-Darling Test Statistic	0.241	95% Bootstrap-t UCL	532.7
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	555.7
Kolmogorov-Smirnov Test Statistic	0.145	95% Percentile Bootstrap UCL	496.5
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	508.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	638.1
		97.5% Chebyshev(Mean, Sd) UCL	736.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	930.3
95% Approximate Gamma UCL	511.7		
95% Adjusted Gamma UCL	523.9		

Potential UCL to Use		Use 95% Approximate Gamma UCL	511.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	12.9	Minimum of Log Data	2.557
Maximum	107.9	Maximum of Log Data	4.681
Mean	64.37	Mean of log Data	4.106
Median	65	SD of log Data	0.422
SD	17.29		
Coefficient of Variation	0.269		
Skewness	-0.74		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.648	Shapiro Wilk Test Statistic	0.494
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.68	95% H-UCL	81.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.13
95% Adjusted-CLT UCL (Chen-1995)	70.46	97.5% Chebyshev (MVUE) UCL	109.2
95% Modified-t UCL (Johnson-1978)	71.56	99% Chebyshev (MVUE) UCL	134.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.94		
MLE of Mean	64.37		
MLE of Standard Deviation	23.99		
nu star	244.8		
Approximate Chi Square Value (.05)	209.6	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	71.26
Adjusted Chi Square Value	206.2	95% Jackknife UCL	71.68
		95% Standard Bootstrap UCL	71.06
Anderson-Darling Test Statistic	3.459	95% Bootstrap-t UCL	70.65
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	71.75
Kolmogorov-Smirnov Test Statistic	0.405	95% Percentile Bootstrap UCL	70.56
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	70.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.64
		97.5% Chebyshev(Mean, Sd) UCL	90.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.1
95% Approximate Gamma UCL	75.18		
95% Adjusted Gamma UCL	76.43		

Potential UCL to Use		
	Use 95% Student's-t UCL	71.68
	or 95% Modified-t UCL	71.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.028	Minimum of Log Data	-3.576
Maximum	11.4	Maximum of Log Data	2.434
Mean	9.55	Mean of log Data	1.97
Median	10	SD of log Data	1.429
SD	2.48		
Coefficient of Variation	0.26		
Skewness	-3.97		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.357	Shapiro Wilk Test Statistic	0.278
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.6	95% H-UCL	66.23
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.29
95% Adjusted-CLT UCL (Chen-1995)	9.921	97.5% Chebyshev (MVUE) UCL	62.87
95% Modified-t UCL (Johnson-1978)	10.5	99% Chebyshev (MVUE) UCL	89.54

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.599	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.974		
MLE of Mean	9.55		
MLE of Standard Deviation	7.554		
nu star	54.35		
Approximate Chi Square Value (.05)	38.41	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	10.54
Adjusted Chi Square Value	37.01	95% Jackknife UCL	10.6
		95% Standard Bootstrap UCL	10.48
Anderson-Darling Test Statistic	5.999	95% Bootstrap-t UCL	10.3
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	10.14
Kolmogorov-Smirnov Test Statistic	0.562	95% Percentile Bootstrap UCL	10.24
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	10.19
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.17
		97.5% Chebyshev(Mean, Sd) UCL	13.31
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.54
95% Approximate Gamma UCL	13.51		
95% Adjusted Gamma UCL	14.03		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.17
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	14.9	Minimum of Log Data	2.701
Maximum	40.5	Maximum of Log Data	3.701
Mean	26.73	Mean of log Data	3.272
Median	26.73	SD of log Data	0.18
SD	4.564		
Coefficient of Variation	0.171		
Skewness	0.704		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	28.67	95% H-UCL	29.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	31.86
95% Adjusted-CLT UCL (Chen-1995)	28.76	97.5% Chebyshev (MVUE) UCL	34.07
95% Modified-t UCL (Johnson-1978)	28.7	99% Chebyshev (MVUE) UCL	38.41

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	28.84	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.927		
MLE of Mean	26.73		
MLE of Standard Deviation	4.978		
nu star	980.5		
Approximate Chi Square Value (.05)	908.8	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	28.55
Adjusted Chi Square Value	901.6	95% Jackknife UCL	28.67
		95% Standard Bootstrap UCL	28.47
Anderson-Darling Test Statistic	4.084	95% Bootstrap-t UCL	28.78
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	30.06
Kolmogorov-Smirnov Test Statistic	0.419	95% Percentile Bootstrap UCL	28.47
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	28.35
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	31.56
		97.5% Chebyshev(Mean, Sd) UCL	33.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.75
95% Approximate Gamma UCL	28.84		
95% Adjusted Gamma UCL	29.07		

Potential UCL to Use		
	Use 95% Student's-t UCL	28.67
	or 95% Modified-t UCL	28.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	180-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.65	Minimum of Log Data	1.732
Maximum	19.2	Maximum of Log Data	2.955
Mean	9.454	Mean of log Data	2.187
Median	11	SD of log Data	0.352
SD	3.56		
Coefficient of Variation	0.377		
Skewness	1.339		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.07	95% H-UCL	11.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.23
95% Adjusted-CLT UCL (Chen-1995)	11.31	97.5% Chebyshev (MVUE) UCL	14.87
95% Modified-t UCL (Johnson-1978)	11.13	99% Chebyshev (MVUE) UCL	18.09

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.887	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.373		
MLE of Mean	9.454		
MLE of Standard Deviation	3.602		
nu star	206.6		
Approximate Chi Square Value (.05)	174.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.97
Adjusted Chi Square Value	170.7	95% Jackknife UCL	11.07
		95% Standard Bootstrap UCL	10.91
Anderson-Darling Test Statistic	1.057	95% Bootstrap-t UCL	11.42
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	12.09
Kolmogorov-Smirnov Test Statistic	0.248	95% Percentile Bootstrap UCL	10.99
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	11.19
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.46
		97.5% Chebyshev(Mean, Sd) UCL	15.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.6
95% Approximate Gamma UCL	11.2		
95% Adjusted Gamma UCL	11.44		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.07
	or 95% Modified-t UCL	11.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	91	Minimum of Log Data	4.511
Maximum	213	Maximum of Log Data	5.361
Mean	152	Mean of log Data	5.012
Median	152	SD of log Data	0.164
SD	23.06		
Coefficient of Variation	0.152		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.512
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	162.5	95% H-UCL	164.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	180.2
95% Adjusted-CLT UCL (Chen-1995)	161.8	97.5% Chebyshev (MVUE) UCL	192.4
95% Modified-t UCL (Johnson-1978)	162.5	99% Chebyshev (MVUE) UCL	216.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	34.34	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.426		
MLE of Mean	152		
MLE of Standard Deviation	25.94		
nu star	1030		
Approximate Chi Square Value (.05)	956.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	161.8
Adjusted Chi Square Value	948.1	95% Jackknife UCL	162.5
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.83	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.454	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	177.9
		97.5% Chebyshev(Mean, Sd) UCL	189.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	211.2
95% Approximate Gamma UCL	163.7		
95% Adjusted Gamma UCL	165.2		

Potential UCL to Use		
	Use 95% Student's-t UCL	162.5
	or 95% Modified-t UCL	162.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Beryllium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.49	Minimum of Log Data	-0.713
Maximum	1.6	Maximum of Log Data	0.47
Mean	1.045	Mean of log Data	0.0219
Median	1.045	SD of log Data	0.231
SD	0.21		
Coefficient of Variation	0.201		
Skewness	1.74E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.14	95% H-UCL	1.175
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.322
95% Adjusted-CLT UCL (Chen-1995)	1.134	97.5% Chebyshev (MVUE) UCL	1.441
95% Modified-t UCL (Johnson-1978)	1.14	99% Chebyshev (MVUE) UCL	1.674

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0572		
MLE of Mean	1.045		
MLE of Standard Deviation	0.244		
nu star	548.5		
Approximate Chi Square Value (.05)	495.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	1.134
Adjusted Chi Square Value	488.9	95% Jackknife UCL	1.14
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.853	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.461	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.281
		97.5% Chebyshev(Mean, Sd) UCL	1.383
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.584
95% Approximate Gamma UCL	1.158		
95% Adjusted Gamma UCL	1.172		

Potential UCL to Use	Use 95% Student's-t UCL	1.14
	or 95% Modified-t UCL	1.14

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	34.03	Minimum of Log Data	3.527
Maximum	85	Maximum of Log Data	4.443
Mean	55.2	Mean of log Data	3.954
Median	45.26	SD of log Data	0.344
SD	20.02		
Coefficient of Variation	0.363		
Skewness	0.734		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.804	Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.31	95% H-UCL	66
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	76.75
95% Adjusted-CLT UCL (Chen-1995)	64.75	97.5% Chebyshev (MVUE) UCL	86.13
95% Modified-t UCL (Johnson-1978)	64.47	99% Chebyshev (MVUE) UCL	104.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.144	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	7.727		
MLE of Mean	55.2		
MLE of Standard Deviation	20.65		
nu star	214.3		
Approximate Chi Square Value (.05)	181.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	63.71
Adjusted Chi Square Value	177.7	95% Jackknife UCL	64.31
		95% Standard Bootstrap UCL	63.24
Anderson-Darling Test Statistic	1.026	95% Bootstrap-t UCL	65.93
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	62.92
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	63.83
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	64.3
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.74
		97.5% Chebyshev(Mean, Sd) UCL	87.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.6
95% Approximate Gamma UCL	65.21		
95% Adjusted Gamma UCL	66.57		

Potential UCL to Use		Use 95% Approximate Gamma UCL	65.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	4.7	Minimum of Log Data	1.548
Maximum	13.2	Maximum of Log Data	2.58
Mean	8.95	Mean of log Data	2.175
Median	8.95	SD of log Data	0.2
SD	1.606		
Coefficient of Variation	0.179		
Skewness	-2.83E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.504
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.681	95% H-UCL	9.89
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11
95% Adjusted-CLT UCL (Chen-1995)	9.632	97.5% Chebyshev (MVUE) UCL	11.87
95% Modified-t UCL (Johnson-1978)	9.681	99% Chebyshev (MVUE) UCL	13.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	23.66	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.378		
MLE of Mean	8.95		
MLE of Standard Deviation	1.84		
nu star	709.7		
Approximate Chi Square Value (.05)	648.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9.632
Adjusted Chi Square Value	641.8	95% Jackknife UCL	9.681
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.842	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.458	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.76
		97.5% Chebyshev(Mean, Sd) UCL	11.54
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.08
95% Approximate Gamma UCL	9.789		
95% Adjusted Gamma UCL	9.898		

Potential UCL to Use		
	Use 95% Student's-t UCL	9.681
	or 95% Modified-t UCL	9.681

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15
Raw Statistics		Log-transformed Statistics	
Minimum	6869	Minimum of Log Data	8.835
Maximum	35300	Maximum of Log Data	10.47
Mean	12772	Mean of log Data	9.348
Median	12479	SD of log Data	0.451
SD	7179		
Coefficient of Variation	0.562		
Skewness	2.375		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.734	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16037	95% H-UCL	16199
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19168
95% Adjusted-CLT UCL (Chen-1995)	17035	97.5% Chebyshev (MVUE) UCL	22005
95% Modified-t UCL (Johnson-1978)	16226	99% Chebyshev (MVUE) UCL	27578
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.914	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3263		
MLE of Mean	12772		
MLE of Standard Deviation	6456		
nu star	117.4		
Approximate Chi Square Value (.05)	93.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	15821
Adjusted Chi Square Value	90.77	95% Jackknife UCL	16037
		95% Standard Bootstrap UCL	15765
Anderson-Darling Test Statistic	0.658	95% Bootstrap-t UCL	18633
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	29645
Kolmogorov-Smirnov Test Statistic	0.155	95% Percentile Bootstrap UCL	15966
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	17726
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20851
		97.5% Chebyshev(Mean, Sd) UCL	24347
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31214
95% Approximate Gamma UCL	16057		
95% Adjusted Gamma UCL	16523		
Potential UCL to Use		Use 95% Approximate Gamma UCL	16057

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	317.4	Minimum of Log Data	5.76
Maximum	1990	Maximum of Log Data	7.596
Mean	618	Mean of log Data	6.305
Median	450.3	SD of log Data	0.453
SD	412.1		
Coefficient of Variation	0.667		
Skewness	2.984		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.612	Shapiro Wilk Test Statistic	0.823
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	805.4	95% H-UCL	774.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	916.3
95% Adjusted-CLT UCL (Chen-1995)	880.6	97.5% Chebyshev (MVUE) UCL	1052
95% Modified-t UCL (Johnson-1978)	819	99% Chebyshev (MVUE) UCL	1320

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.457	Data do not follow a Discernable Distribution (0.05)	
Theta Star	178.8		
MLE of Mean	618		
MLE of Standard Deviation	332.4		
nu star	103.7		
Approximate Chi Square Value (.05)	81.21	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	793
Adjusted Chi Square Value	78.76	95% Jackknife UCL	805.4
		95% Standard Bootstrap UCL	786.3
Anderson-Darling Test Statistic	1.347	95% Bootstrap-t UCL	1102
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1448
Kolmogorov-Smirnov Test Statistic	0.236	95% Percentile Bootstrap UCL	816.5
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	915.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1082
		97.5% Chebyshev(Mean, Sd) UCL	1282
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1677
95% Approximate Gamma UCL	789.2		
95% Adjusted Gamma UCL	813.7		

Potential UCL to Use		
	Use 95% Student's-t UCL	805.4
	or 95% Modified-t UCL	819

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0197	Minimum of Log Data	-3.927
Maximum	10	Maximum of Log Data	2.303
Mean	8.463	Mean of log Data	1.489
Median	10	SD of log Data	2.076
SD	3.516		
Coefficient of Variation	0.415		
Skewness	-2.2		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.49	Shapiro Wilk Test Statistic	0.44
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.06	95% H-UCL	523.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	100.1
95% Adjusted-CLT UCL (Chen-1995)	9.406	97.5% Chebyshev (MVUE) UCL	131.7
95% Modified-t UCL (Johnson-1978)	9.976	99% Chebyshev (MVUE) UCL	193.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.768	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.03		
MLE of Mean	8.463		
MLE of Standard Deviation	9.66		
nu star	23.03		
Approximate Chi Square Value (.05)	13.11	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9.957
Adjusted Chi Square Value	12.2	95% Jackknife UCL	10.06
		95% Standard Bootstrap UCL	9.881
Anderson-Darling Test Statistic	4.622	95% Bootstrap-t UCL	9.754
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	9.527
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	9.585
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	9.336
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.42
		97.5% Chebyshev(Mean, Sd) UCL	14.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.5
95% Approximate Gamma UCL	14.86		
95% Adjusted Gamma UCL	15.98		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.5

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	10.2	Minimum of Log Data	2.322
Maximum	90.24	Maximum of Log Data	4.502
Mean	62.41	Mean of log Data	4.061
Median	65	SD of log Data	0.493
SD	16.38		
Coefficient of Variation	0.262		
Skewness	-2.239		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.461
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.85	95% H-UCL	85.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.1
95% Adjusted-CLT UCL (Chen-1995)	66.75	97.5% Chebyshev (MVUE) UCL	118.1
95% Modified-t UCL (Johnson-1978)	69.45	99% Chebyshev (MVUE) UCL	149.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.713	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.92		
MLE of Mean	62.41		
MLE of Standard Deviation	26.11		
nu star	171.4		
Approximate Chi Square Value (.05)	142.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	69.36
Adjusted Chi Square Value	138.8	95% Jackknife UCL	69.85
		95% Standard Bootstrap UCL	69.12
Anderson-Darling Test Statistic	3.165	95% Bootstrap-t UCL	67.81
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	67.85
Kolmogorov-Smirnov Test Statistic	0.382	95% Percentile Bootstrap UCL	68.01
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	67.32
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.84
		97.5% Chebyshev(Mean, Sd) UCL	88.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.5
95% Approximate Gamma UCL	75.26		
95% Adjusted Gamma UCL	77.04		

Potential UCL to Use		
	Use 95% Student's-t UCL	69.85
	or 95% Modified-t UCL	69.45

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	11.61	Maximum of Log Data	2.452
Mean	8.757	Mean of log Data	1.54
Median	10	SD of log Data	2.036
SD	3.568		
Coefficient of Variation	0.408		
Skewness	-2.328		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.489	Shapiro Wilk Test Statistic	0.427
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.38	95% H-UCL	462
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.57
95% Adjusted-CLT UCL (Chen-1995)	9.681	97.5% Chebyshev (MVUE) UCL	128.2
95% Modified-t UCL (Johnson-1978)	10.29	99% Chebyshev (MVUE) UCL	188.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.785	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.16		
MLE of Mean	8.757		
MLE of Standard Deviation	9.886		
nu star	23.54		
Approximate Chi Square Value (.05)	13.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.27
Adjusted Chi Square Value	12.57	95% Jackknife UCL	10.38
		95% Standard Bootstrap UCL	10.25
Anderson-Darling Test Statistic	4.809	95% Bootstrap-t UCL	9.883
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	9.769
Kolmogorov-Smirnov Test Statistic	0.539	95% Percentile Bootstrap UCL	10.09
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	9.957
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.77
		97.5% Chebyshev(Mean, Sd) UCL	14.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.92
95% Approximate Gamma UCL	15.27		
95% Adjusted Gamma UCL	16.4		

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.92
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0078	Minimum of Log Data	-4.854
Maximum	0.0215	Maximum of Log Data	-3.84
Mean	0.0147	Mean of log Data	-4.24
Median	0.0147	SD of log Data	0.196
SD	0.00259		
Coefficient of Variation	0.177		
Skewness	1.26E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.505
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0158	95% H-UCL	0.0162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0179
95% Adjusted-CLT UCL (Chen-1995)	0.0157	97.5% Chebyshev (MVUE) UCL	0.0193
95% Modified-t UCL (Johnson-1978)	0.0158	99% Chebyshev (MVUE) UCL	0.0221

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	24.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.98E-04		
MLE of Mean	0.0147		
MLE of Standard Deviation	0.00296		
nu star	734.9		
Approximate Chi Square Value (.05)	673	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.0157
Adjusted Chi Square Value	665.7	95% Jackknife UCL	0.0158
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.841	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0176
		97.5% Chebyshev(Mean, Sd) UCL	0.0188
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0213
95% Approximate Gamma UCL	0.016		
95% Adjusted Gamma UCL	0.0162		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0158
	or 95% Modified-t UCL	0.0158

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	15.9	Minimum of Log Data	2.766
Maximum	48.5	Maximum of Log Data	3.882
Mean	32.2	Mean of log Data	3.452
Median	32.2	SD of log Data	0.217
SD	6.161		
Coefficient of Variation	0.191		
Skewness	1.92E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.5
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35	95% H-UCL	35.92
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	40.21
95% Adjusted-CLT UCL (Chen-1995)	34.82	97.5% Chebyshev (MVUE) UCL	43.64
95% Modified-t UCL (Johnson-1978)	35	99% Chebyshev (MVUE) UCL	50.38

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	20.44	Data do not follow a Discernable Distribution (0.05)		
Theta Star	1.575			
MLE of Mean	32.2			
MLE of Standard Deviation	7.122			
nu star	613.3			
Approximate Chi Square Value (.05)	556.9	Nonparametric Statistics		
Adjusted Level of Significance	0.0324	95% CLT UCL		34.82
Adjusted Chi Square Value	550.2	95% Jackknife UCL		35
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.848	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		39.13
		97.5% Chebyshev(Mean, Sd) UCL		42.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		48.03
95% Approximate Gamma UCL	35.46			
95% Adjusted Gamma UCL	35.89			

Potential UCL to Use		
	Use 95% Student's-t UCL	35
	or 95% Modified-t UCL	35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	180-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	6.68	Minimum of Log Data	1.899
Maximum	138	Maximum of Log Data	4.927
Mean	24.04	Mean of log Data	2.645
Median	11	SD of log Data	0.874
SD	38.62		
Coefficient of Variation	1.606		
Skewness	3.086		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.471	Shapiro Wilk Test Statistic	0.695
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	45.15	95% H-UCL	44.32
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43.6
95% Adjusted-CLT UCL (Chen-1995)	54.77	97.5% Chebyshev (MVUE) UCL	53.92
95% Modified-t UCL (Johnson-1978)	46.95	99% Chebyshev (MVUE) UCL	74.19

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.839	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.64		
MLE of Mean	24.04		
MLE of Standard Deviation	26.24		
nu star	18.47		
Approximate Chi Square Value (.05)	9.73	Nonparametric Statistics	
Adjusted Level of Significance	0.028	95% CLT UCL	43.19
Adjusted Chi Square Value	8.714	95% Jackknife UCL	45.15
		95% Standard Bootstrap UCL	42.1
Anderson-Darling Test Statistic	2.044	95% Bootstrap-t UCL	304.6
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	270.7
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	45.26
Kolmogorov-Smirnov 5% Critical Value	0.262	95% BCA Bootstrap UCL	59.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.8
		97.5% Chebyshev(Mean, Sd) UCL	96.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	139.9
95% Approximate Gamma UCL	45.63		
95% Adjusted Gamma UCL	50.95		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	74.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	37.68	Minimum of Log Data	3.629
Maximum	85	Maximum of Log Data	4.443
Mean	63.86	Mean of log Data	4.106
Median	55.44	SD of log Data	0.34
SD	20.82		
Coefficient of Variation	0.326		
Skewness	0.028		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.811
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	75.24	95% H-UCL	79.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.76
95% Adjusted-CLT UCL (Chen-1995)	74.24	97.5% Chebyshev (MVUE) UCL	105.2
95% Modified-t UCL (Johnson-1978)	75.25	99% Chebyshev (MVUE) UCL	129.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.287	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.763		
MLE of Mean	63.86		
MLE of Standard Deviation	23.66		
nu star	160.3		
Approximate Chi Square Value (.05)	132	Nonparametric Statistics	
Adjusted Level of Significance	0.028	95% CLT UCL	74.19
Adjusted Chi Square Value	127.9	95% Jackknife UCL	75.24
		95% Standard Bootstrap UCL	73.68
Anderson-Darling Test Statistic	1.043	95% Bootstrap-t UCL	75.89
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	72.66
Kolmogorov-Smirnov Test Statistic	0.308	95% Percentile Bootstrap UCL	73.77
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	74.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.23
		97.5% Chebyshev(Mean, Sd) UCL	103.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.3
95% Approximate Gamma UCL	77.53		
95% Adjusted Gamma UCL	80.07		

Potential UCL to Use		
	Use 95% Student's-t UCL	75.24
	or 95% Modified-t UCL	75.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	9.51	Minimum of Log Data	2.252
Maximum	1992	Maximum of Log Data	7.597
Mean	303.9	Mean of log Data	4.271
Median	43.19	SD of log Data	1.695
SD	602.7		
Coefficient of Variation	1.984		
Skewness	2.651		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.563	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	633.3	95% H-UCL	3300
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	799.3
95% Adjusted-CLT UCL (Chen-1995)	758	97.5% Chebyshev (MVUE) UCL	1043
95% Modified-t UCL (Johnson-1978)	657.5	99% Chebyshev (MVUE) UCL	1522

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.386	Data appear Lognormal at 5% Significance Level	
Theta Star	787.6		
MLE of Mean	303.9		
MLE of Standard Deviation	489.2		
nu star	8.488		
Approximate Chi Square Value (.05)	3.021	Nonparametric Statistics	
Adjusted Level of Significance	0.028	95% CLT UCL	602.8
Adjusted Chi Square Value	2.514	95% Jackknife UCL	633.3
		95% Standard Bootstrap UCL	586.2
Anderson-Darling Test Statistic	1.004	95% Bootstrap-t UCL	2077
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	2222
Kolmogorov-Smirnov Test Statistic	0.314	95% Percentile Bootstrap UCL	635.6
Kolmogorov-Smirnov 5% Critical Value	0.271	95% BCA Bootstrap UCL	836.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1096
		97.5% Chebyshev(Mean, Sd) UCL	1439
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2112
95% Approximate Gamma UCL	853.8		
95% Adjusted Gamma UCL	1026		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	2112

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.029	Minimum of Log Data	-3.547
Maximum	10	Maximum of Log Data	2.303
Mean	8.937	Mean of log Data	1.754
Median	10	SD of log Data	1.759
SD	2.999		
Coefficient of Variation	0.336		
Skewness	-3.16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.421	Shapiro Wilk Test Statistic	0.36
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.58	95% H-UCL	352
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.83
95% Adjusted-CLT UCL (Chen-1995)	9.505	97.5% Chebyshev (MVUE) UCL	93.96
95% Modified-t UCL (Johnson-1978)	10.43	99% Chebyshev (MVUE) UCL	137.4

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.996	Data do not follow a Discernable Distribution (0.05)		
Theta Star	8.972			
MLE of Mean	8.937			
MLE of Standard Deviation	8.955			
nu star	21.91			
Approximate Chi Square Value (.05)	12.27	Nonparametric Statistics		
Adjusted Level of Significance	0.028	95% CLT UCL		10.42
Adjusted Chi Square Value	11.11	95% Jackknife UCL		10.58
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.709	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.261	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12.88
		97.5% Chebyshev(Mean, Sd) UCL		14.58
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		17.94
95% Approximate Gamma UCL	15.96			
95% Adjusted Gamma UCL	17.62			

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.94

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	13.4	Minimum of Log Data	2.595
Maximum	90.33	Maximum of Log Data	4.503
Mean	63.51	Mean of log Data	4.074
Median	65	SD of log Data	0.501
SD	18.38		
Coefficient of Variation	0.289		
Skewness	-2.07		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.637	Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	73.56	95% H-UCL	94.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.1
95% Adjusted-CLT UCL (Chen-1995)	68.94	97.5% Chebyshev (MVUE) UCL	129.2
95% Modified-t UCL (Johnson-1978)	72.98	99% Chebyshev (MVUE) UCL	166.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.865	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.06		
MLE of Mean	63.51		
MLE of Standard Deviation	28.8		
nu star	107		
Approximate Chi Square Value (.05)	84.15	Nonparametric Statistics	
Adjusted Level of Significance	0.028	95% CLT UCL	72.63
Adjusted Chi Square Value	80.85	95% Jackknife UCL	73.56
		95% Standard Bootstrap UCL	72.1
Anderson-Darling Test Statistic	2.497	95% Bootstrap-t UCL	70.46
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	70.34
Kolmogorov-Smirnov Test Statistic	0.484	95% Percentile Bootstrap UCL	71.41
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	70.01
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.67
		97.5% Chebyshev(Mean, Sd) UCL	98.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	118.7
95% Approximate Gamma UCL	80.78		
95% Adjusted Gamma UCL	84.08		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	87.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	180-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.25	Minimum of Log Data	-1.386
Maximum	0.59	Maximum of Log Data	-0.528
Mean	0.42	Mean of log Data	-0.882
Median	0.42	SD of log Data	0.186
SD	0.073		
Coefficient of Variation	0.173		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.579
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.458	95% H-UCL	0.467
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.519
95% Adjusted-CLT UCL (Chen-1995)	0.454	97.5% Chebyshev (MVUE) UCL	0.562
95% Modified-t UCL (Johnson-1978)	0.458	99% Chebyshev (MVUE) UCL	0.646

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	25.33	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.017		
MLE of Mean	0.42		
MLE of Standard Deviation	0.084		
nu star	607.9		
Approximate Chi Square Value (.05)	551.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.454
Adjusted Chi Square Value	543.5	95% Jackknife UCL	0.458
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.741	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.511
		97.5% Chebyshev(Mean, Sd) UCL	0.551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.628
95% Approximate Gamma UCL	0.463		
95% Adjusted Gamma UCL	0.47		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.458
	or 95% Modified-t UCL	0.458

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	8.09	Minimum of Log Data	2.091
Maximum	18.65	Maximum of Log Data	2.926
Mean	11.27	Mean of log Data	2.401
Median	11	SD of log Data	0.209
SD	2.666		
Coefficient of Variation	0.237		
Skewness	2.038		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.739	Shapiro Wilk Test Statistic	0.82
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.65	95% H-UCL	12.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.23
95% Adjusted-CLT UCL (Chen-1995)	13.02	97.5% Chebyshev (MVUE) UCL	15.51
95% Modified-t UCL (Johnson-1978)	12.73	99% Chebyshev (MVUE) UCL	18.04

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.56	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.642		
MLE of Mean	11.27		
MLE of Standard Deviation	2.69		
nu star	421.4		
Approximate Chi Square Value (.05)	374.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.54
Adjusted Chi Square Value	368.1	95% Jackknife UCL	12.65
		95% Standard Bootstrap UCL	12.53
Anderson-Darling Test Statistic	1.192	95% Bootstrap-t UCL	13.61
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	19.85
Kolmogorov-Smirnov Test Statistic	0.352	95% Percentile Bootstrap UCL	12.55
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.63
		97.5% Chebyshev(Mean, Sd) UCL	16.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.93
95% Approximate Gamma UCL	12.67		
95% Adjusted Gamma UCL	12.9		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.65
	or 95% Modified-t UCL	12.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	14.5	Minimum of Log Data	2.674
Maximum	85	Maximum of Log Data	4.443
Mean	59.98	Mean of log Data	3.97
Median	64.82	SD of log Data	0.566
SD	27.08		
Coefficient of Variation	0.451		
Skewness	-0.27		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.776	Shapiro Wilk Test Statistic	0.79
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.02	95% H-UCL	90.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.2
95% Adjusted-CLT UCL (Chen-1995)	72.19	97.5% Chebyshev (MVUE) UCL	125.7
95% Modified-t UCL (Johnson-1978)	73.92	99% Chebyshev (MVUE) UCL	163.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.195	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.78		
MLE of Mean	59.98		
MLE of Standard Deviation	33.56		
nu star	76.67		
Approximate Chi Square Value (.05)	57.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	72.84
Adjusted Chi Square Value	54.97	95% Jackknife UCL	74.02
		95% Standard Bootstrap UCL	72.03
Anderson-Darling Test Statistic	1.171	95% Bootstrap-t UCL	72.93
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	71.04
Kolmogorov-Smirnov Test Statistic	0.32	95% Percentile Bootstrap UCL	73.2
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	71.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.06
		97.5% Chebyshev(Mean, Sd) UCL	108.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	137.8
95% Approximate Gamma UCL	79.98		
95% Adjusted Gamma UCL	83.66		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	94.06
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	10.7	Minimum of Log Data	2.37
Maximum	84.16	Maximum of Log Data	4.433
Mean	59.09	Mean of log Data	3.921
Median	65	SD of log Data	0.716
SD	23.53		
Coefficient of Variation	0.398		
Skewness	-1.6		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.672	Shapiro Wilk Test Statistic	0.567
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.29	95% H-UCL	110.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	123.3
95% Adjusted-CLT UCL (Chen-1995)	66.91	97.5% Chebyshev (MVUE) UCL	149.1
95% Modified-t UCL (Johnson-1978)	70.77	99% Chebyshev (MVUE) UCL	199.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.541	Data do not follow a Discernable Distribution (0.05)	
Theta Star	23.25		
MLE of Mean	59.09		
MLE of Standard Deviation	37.07		
nu star	60.99		
Approximate Chi Square Value (.05)	44.03	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	70.27
Adjusted Chi Square Value	41.84	95% Jackknife UCL	71.29
		95% Standard Bootstrap UCL	69.81
Anderson-Darling Test Statistic	2.548	95% Bootstrap-t UCL	68
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	66.97
Kolmogorov-Smirnov Test Statistic	0.474	95% Percentile Bootstrap UCL	69.47
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	68.09
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.7
		97.5% Chebyshev(Mean, Sd) UCL	101.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.7
95% Approximate Gamma UCL	81.86		
95% Adjusted Gamma UCL	86.15		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	88.7
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	180-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	4.4	Minimum of Log Data	1.482
Maximum	30.3	Maximum of Log Data	3.411
Mean	11.07	Mean of log Data	2.329
Median	11	SD of log Data	0.378
SD	5.374		
Coefficient of Variation	0.485		
Skewness	3.049		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.613	Shapiro Wilk Test Statistic	0.812
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.35	95% H-UCL	13.23
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.46
95% Adjusted-CLT UCL (Chen-1995)	14.25	97.5% Chebyshev (MVUE) UCL	17.39
95% Modified-t UCL (Johnson-1978)	13.51	99% Chebyshev (MVUE) UCL	21.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.614	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.972		
MLE of Mean	11.07		
MLE of Standard Deviation	4.673		
nu star	190.9		
Approximate Chi Square Value (.05)	159.9	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	13.22
Adjusted Chi Square Value	157	95% Jackknife UCL	13.35
		95% Standard Bootstrap UCL	13.19
Anderson-Darling Test Statistic	1.625	95% Bootstrap-t UCL	15.31
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	23
Kolmogorov-Smirnov Test Statistic	0.279	95% Percentile Bootstrap UCL	13.39
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	14.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.75
		97.5% Chebyshev(Mean, Sd) UCL	19.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.04
95% Approximate Gamma UCL	13.22		
95% Adjusted Gamma UCL	13.47		

Potential UCL to Use		
	Use 95% Student's-t UCL	13.35
	or 95% Modified-t UCL	13.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	13.2	Minimum of Log Data	2.58
Maximum	85	Maximum of Log Data	4.443
Mean	73.7	Mean of log Data	4.22
Median	85	SD of log Data	0.491
SD	22.11		
Coefficient of Variation	0.3		
Skewness	-1.81		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.579	Shapiro Wilk Test Statistic	0.531
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	83.06	95% H-UCL	98.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	117
95% Adjusted-CLT UCL (Chen-1995)	80.01	97.5% Chebyshev (MVUE) UCL	134.7
95% Modified-t UCL (Johnson-1978)	82.67	99% Chebyshev (MVUE) UCL	169.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.336	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.81		
MLE of Mean	73.7		
MLE of Standard Deviation	31.9		
nu star	181.4		
Approximate Chi Square Value (.05)	151.3	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	82.52
Adjusted Chi Square Value	148.4	95% Jackknife UCL	83.06
		95% Standard Bootstrap UCL	82.33
Anderson-Darling Test Statistic	3.527	95% Bootstrap-t UCL	81.13
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	80.37
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	80.78
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	80.24
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	97.07
		97.5% Chebyshev(Mean, Sd) UCL	107.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	127.1
95% Approximate Gamma UCL	88.39		
95% Adjusted Gamma UCL	90.11		

Potential UCL to Use		
	Use 95% Student's-t UCL	83.06
	or 95% Modified-t UCL	82.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	12.9	Minimum of Log Data	2.557
Maximum	68.91	Maximum of Log Data	4.233
Mean	62.29	Mean of log Data	4.085
Median	65	SD of log Data	0.394
SD	12.78		
Coefficient of Variation	0.205		
Skewness	-4.06		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.322	Shapiro Wilk Test Statistic	0.291
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.71	95% H-UCL	77.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	91.08
95% Adjusted-CLT UCL (Chen-1995)	64.13	97.5% Chebyshev (MVUE) UCL	102.8
95% Modified-t UCL (Johnson-1978)	67.2	99% Chebyshev (MVUE) UCL	125.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.889	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.008		
MLE of Mean	62.29		
MLE of Standard Deviation	20.89		
nu star	302.2		
Approximate Chi Square Value (.05)	263	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	67.39
Adjusted Chi Square Value	259.1	95% Jackknife UCL	67.71
		95% Standard Bootstrap UCL	67.2
Anderson-Darling Test Statistic	5.606	95% Bootstrap-t UCL	66
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	65.48
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	65.7
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	65.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.81
		97.5% Chebyshev(Mean, Sd) UCL	81.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	93.14
95% Approximate Gamma UCL	71.6		
95% Adjusted Gamma UCL	72.66		

Potential UCL to Use		
	Use 95% Student's-t UCL	67.71
	or 95% Modified-t UCL	67.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	17	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.043	Minimum of Log Data	-3.147
Maximum	11.4	Maximum of Log Data	2.434
Mean	9.521	Mean of log Data	1.992
Median	10	SD of log Data	1.325
SD	2.467		
Coefficient of Variation	0.259		
Skewness	-3.98		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.343	Shapiro Wilk Test Statistic	0.276
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.57	95% H-UCL	50.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	42.18
95% Adjusted-CLT UCL (Chen-1995)	9.889	97.5% Chebyshev (MVUE) UCL	53.43
95% Modified-t UCL (Johnson-1978)	10.47	99% Chebyshev (MVUE) UCL	75.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.739	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.474		
MLE of Mean	9.521		
MLE of Standard Deviation	7.219		
nu star	59.13		
Approximate Chi Square Value (.05)	42.45	Nonparametric Statistics	
Adjusted Level of Significance	0.035	95% CLT UCL	10.5
Adjusted Chi Square Value	40.97	95% Jackknife UCL	10.57
		95% Standard Bootstrap UCL	10.47
Anderson-Darling Test Statistic	6.024	95% Bootstrap-t UCL	10.25
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	10.13
Kolmogorov-Smirnov Test Statistic	0.561	95% Percentile Bootstrap UCL	10.19
Kolmogorov-Smirnov 5% Critical Value	0.212	95% BCA Bootstrap UCL	10.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.13
		97.5% Chebyshev(Mean, Sd) UCL	13.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.47
95% Approximate Gamma UCL	13.26		
95% Adjusted Gamma UCL	13.74		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.13

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	180-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	5.78	Minimum of Log Data	1.754
Maximum	19.2	Maximum of Log Data	2.955
Mean	9.981	Mean of log Data	2.249
Median	11	SD of log Data	0.333
SD	3.408		
Coefficient of Variation	0.341		
Skewness	1.119		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.8
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.53	95% H-UCL	11.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.77
95% Adjusted-CLT UCL (Chen-1995)	11.7	97.5% Chebyshev (MVUE) UCL	15.41
95% Modified-t UCL (Johnson-1978)	11.57	99% Chebyshev (MVUE) UCL	18.63

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.898	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.264		
MLE of Mean	9.981		
MLE of Standard Deviation	3.552		
nu star	236.9		
Approximate Chi Square Value (.05)	202.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	11.43
Adjusted Chi Square Value	198.4	95% Jackknife UCL	11.53
		95% Standard Bootstrap UCL	11.33
Anderson-Darling Test Statistic	1.626	95% Bootstrap-t UCL	11.7
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	12.29
Kolmogorov-Smirnov Test Statistic	0.328	95% Percentile Bootstrap UCL	11.43
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	11.73
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.82
		97.5% Chebyshev(Mean, Sd) UCL	15.48
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.74
95% Approximate Gamma UCL	11.69		
95% Adjusted Gamma UCL	11.92		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.53
	or 95% Modified-t UCL	11.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Barium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Beryllium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	24.8	Minimum of Log Data	3.211
Maximum	85	Maximum of Log Data	4.443
Mean	64.8	Mean of log Data	4.093
Median	85	SD of log Data	0.434
SD	23.74		
Coefficient of Variation	0.366		
Skewness	-0.492		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.774	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	75.6	95% H-UCL	83.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.12
95% Adjusted-CLT UCL (Chen-1995)	74.05	97.5% Chebyshev (MVUE) UCL	112.3
95% Modified-t UCL (Johnson-1978)	75.47	99% Chebyshev (MVUE) UCL	140.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.268	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.3		
MLE of Mean	64.8		
MLE of Standard Deviation	28.24		
nu star	158		
Approximate Chi Square Value (.05)	130	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	74.88
Adjusted Chi Square Value	126.8	95% Jackknife UCL	75.6
		95% Standard Bootstrap UCL	74.48
Anderson-Darling Test Statistic	1.485	95% Bootstrap-t UCL	74.52
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	73.29
Kolmogorov-Smirnov Test Statistic	0.337	95% Percentile Bootstrap UCL	74.29
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	74.24
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.52
		97.5% Chebyshev(Mean, Sd) UCL	103.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	125.8
95% Approximate Gamma UCL	78.8		
95% Adjusted Gamma UCL	80.74		

Potential UCL to Use		
	Use 95% Student's-t UCL	75.6
	or 95% Modified-t UCL	75.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	6869	Minimum of Log Data	8.835
Maximum	35300	Maximum of Log Data	10.47
Mean	12227	Mean of log Data	9.304
Median	10245	SD of log Data	0.442
SD	7127		
Coefficient of Variation	0.583		
Skewness	2.65		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.684	Shapiro Wilk Test Statistic	0.867
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15468	95% H-UCL	15362
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18162
95% Adjusted-CLT UCL (Chen-1995)	#######	97.5% Chebyshev (MVUE) UCL	20815
95% Modified-t UCL (Johnson-1978)	15677	99% Chebyshev (MVUE) UCL	26026

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.915	Data Follow Appr. Gamma Distribution at 5% Significance L	
Theta Star	3123		
MLE of Mean	12227		
MLE of Standard Deviation	6179		
nu star	117.5		
Approximate Chi Square Value (.05)	93.44	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	15253
Adjusted Chi Square Value	90.8	95% Jackknife UCL	15468
		95% Standard Bootstrap UCL	15196
Anderson-Darling Test Statistic	0.828	95% Bootstrap-t UCL	18232
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	27813
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	15464
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	16803
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20247
		97.5% Chebyshev(Mean, Sd) UCL	23718
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30535
95% Approximate Gamma UCL	15370		
95% Adjusted Gamma UCL	15816		

Potential UCL to Use		Use 95% Approximate Gamma UCL	15370

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	157.2	Minimum of Log Data	5.058
Maximum	1990	Maximum of Log Data	7.596
Mean	495.4	Mean of log Data	5.97
Median	415.7	SD of log Data	0.645
SD	455.7		
Coefficient of Variation	0.92		
Skewness	2.859		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.638	Shapiro Wilk Test Statistic	0.912
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	702.7	95% H-UCL	708.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	835
95% Adjusted-CLT UCL (Chen-1995)	781.8	97.5% Chebyshev (MVUE) UCL	991
95% Modified-t UCL (Johnson-1978)	717.1	99% Chebyshev (MVUE) UCL	1298

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.863	Data appear Lognormal at 5% Significance Level	
Theta Star	265.9		
MLE of Mean	495.4		
MLE of Standard Deviation	362.9		
nu star	55.9		
Approximate Chi Square Value (.05)	39.72	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	689
Adjusted Chi Square Value	38.04	95% Jackknife UCL	702.7
		95% Standard Bootstrap UCL	680.1
Anderson-Darling Test Statistic	0.892	95% Bootstrap-t UCL	1044
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1582
Kolmogorov-Smirnov Test Statistic	0.23	95% Percentile Bootstrap UCL	696
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	793.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1008
		97.5% Chebyshev(Mean, Sd) UCL	1230
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1666
95% Approximate Gamma UCL	697.3		
95% Adjusted Gamma UCL	728		

Potential UCL to Use		Use 95% H-UCL	708.9

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	10.2	Minimum of Log Data	2.322
Maximum	65	Maximum of Log Data	4.174
Mean	60.41	Mean of log Data	4.035
Median	65	SD of log Data	0.476
SD	14.14		
Coefficient of Variation	0.234		
Skewness	-3.659		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.378	Shapiro Wilk Test Statistic	0.331
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.84	95% H-UCL	82.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	97.42
95% Adjusted-CLT UCL (Chen-1995)	62.73	97.5% Chebyshev (MVUE) UCL	112.4
95% Modified-t UCL (Johnson-1978)	66.26	99% Chebyshev (MVUE) UCL	141.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.269	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.635		
MLE of Mean	60.41		
MLE of Standard Deviation	24.13		
nu star	188.1		
Approximate Chi Square Value (.05)	157.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	66.41
Adjusted Chi Square Value	153.9	95% Jackknife UCL	66.84
		95% Standard Bootstrap UCL	66.17
Anderson-Darling Test Statistic	4.579	95% Bootstrap-t UCL	64.87
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	64.12
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	64.73
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	64.06
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.32
		97.5% Chebyshev(Mean, Sd) UCL	83.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	96.74
95% Approximate Gamma UCL	72.2		
95% Adjusted Gamma UCL	73.83		

Potential UCL to Use		
	Use 95% Student's-t UCL	66.84
	or 95% Modified-t UCL	66.26

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	10	Maximum of Log Data	2.303
Mean	9.314	Mean of log Data	1.913
Median	10	SD of log Data	1.499
SD	2.57		
Coefficient of Variation	0.276		
Skewness	-3.866		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.297	Shapiro Wilk Test Statistic	0.286
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.48	95% H-UCL	88.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	53.29
95% Adjusted-CLT UCL (Chen-1995)	9.698	97.5% Chebyshev (MVUE) UCL	68.47
95% Modified-t UCL (Johnson-1978)	10.37	99% Chebyshev (MVUE) UCL	98.28

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.419	Data do not follow a Discernable Distribution (0.05)		
Theta Star	6.564			
MLE of Mean	9.314			
MLE of Standard Deviation	7.819			
nu star	42.57			
Approximate Chi Square Value (.05)	28.61	Nonparametric Statistics		
Adjusted Level of Significance	0.0324	95% CLT UCL		10.41
Adjusted Chi Square Value	27.21	95% Jackknife UCL		10.48
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	5.525	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.554	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12.21
		97.5% Chebyshev(Mean, Sd) UCL		13.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		15.92
95% Approximate Gamma UCL	13.86			
95% Adjusted Gamma UCL	14.57			

Potential UCL to Use		
	Use 95% Chebyshev (Mean, Sd) UCL	12.21

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Vanadium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	181-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	20.4	Minimum of Log Data	3.016
Maximum	47.9	Maximum of Log Data	3.869
Mean	33.17	Mean of log Data	3.495
Median	33.17	SD of log Data	0.118
SD	3.771		
Coefficient of Variation	0.114		
Skewness	0.826		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.406	Shapiro Wilk Test Statistic	0.402
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	34.38	95% H-UCL	34.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.4
95% Adjusted-CLT UCL (Chen-1995)	34.46	97.5% Chebyshev (MVUE) UCL	37.79
95% Modified-t UCL (Johnson-1978)	34.4	99% Chebyshev (MVUE) UCL	40.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	69.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.475		
MLE of Mean	33.17		
MLE of Standard Deviation	3.97		
nu star	3908		
Approximate Chi Square Value (.05)	3764	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	34.34
Adjusted Chi Square Value	3755	95% Jackknife UCL	34.38
		95% Standard Bootstrap UCL	34.3
Anderson-Darling Test Statistic	8.112	95% Bootstrap-t UCL	34.35
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	35.26
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	34.29
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	34.68
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	36.27
		97.5% Chebyshev(Mean, Sd) UCl	37.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	40.26
95% Approximate Gamma UCL	34.44		
95% Adjusted Gamma UCL	34.52		

Potential UCL to Use		
	Use 95% Student's-t UCL	34.38
	or 95% Modified-t UCL	34.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	0.17	Maximum of Log Data	-1.772
Mean	0.0967	Mean of log Data	-2.371
Median	0.0967	SD of log Data	0.32
SD	0.0204		
Coefficient of Variation	0.211		
Skewness	-0.263		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.386	Shapiro Wilk Test Statistic	0.317
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.103	95% H-UCL	0.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.124
95% Adjusted-CLT UCL (Chen-1995)	0.103	97.5% Chebyshev (MVUE) UCL	0.136
95% Modified-t UCL (Johnson-1978)	0.103	99% Chebyshev (MVUE) UCL	0.158

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.96	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00746		
MLE of Mean	0.0967		
MLE of Standard Deviation	0.0268		
nu star	726		
Approximate Chi Square Value (.05)	664.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	0.103
Adjusted Chi Square Value	660.8	95% Jackknife UCL	0.103
		95% Standard Bootstrap UCL	0.103
Anderson-Darling Test Statistic	8.68	95% Bootstrap-t UCL	0.102
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.104
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	0.102
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	0.102
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.113
		97.5% Chebyshev(Mean, Sd) UCl	0.121
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.135
95% Approximate Gamma UCL	0.106		
95% Adjusted Gamma UCL	0.106		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.103
	or 95% Modified-t UCL	0.103

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	1.86	Minimum of Log Data	0.621
Maximum	9.12	Maximum of Log Data	2.21
Mean	4.827	Mean of log Data	1.551
Median	4.827	SD of log Data	0.228
SD	1.036		
Coefficient of Variation	0.215		
Skewness	#######		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.432	Shapiro Wilk Test Statistic	0.438
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.16	95% H-UCL	5.231
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.754
95% Adjusted-CLT UCL (Chen-1995)	5.221	97.5% Chebyshev (MVUE) UCL	6.151
95% Modified-t UCL (Johnson-1978)	5.171	99% Chebyshev (MVUE) UCL	6.93

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.74	Data do not follow a Discernable Distribution (0.05)	
Theta Star	#######		
MLE of Mean	4.827		
MLE of Standard Deviation	1.086		
nu star	1106		
Approximate Chi Square Value (.05)	1029	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	5.149
Adjusted Chi Square Value	1025	95% Jackknife UCL	5.16
		95% Standard Bootstrap UCL	5.142
Anderson-Darling Test Statistic	7.698	95% Bootstrap-t UCL	5.211
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	6.054
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	5.133
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	5.181
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.68
		97.5% Chebyshev(Mean, Sd) UCl	6.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.775
95% Approximate Gamma UCL	5.184		
95% Adjusted Gamma UCL	5.207		

Potential UCL to Use		
	Use 95% Student's-t UCL	5.16
	or 95% Modified-t UCL	5.171

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0285	Minimum of Log Data	-3.557
Maximum	0.0391	Maximum of Log Data	-3.241
Mean	0.0338	Mean of log Data	-3.387
Median	0.0338	SD of log Data	0.0431
SD	0.00144		
Coefficient of Variation	0.0427		
Skewness	#######		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.375	Shapiro Wilk Test Statistic	0.372
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0343	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.035
95% Adjusted-CLT UCL (Chen-1995)	0.0343	97.5% Chebyshev (MVUE) UCL	0.0356
95% Modified-t UCL (Johnson-1978)	0.0343	99% Chebyshev (MVUE) UCL	0.0366

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	502.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	#######		
MLE of Mean	0.0338		
MLE of Standard Deviation	0.00151		
nu star	28152		
Approximate Chi Square Value (.05)	27763	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	0.0343
Adjusted Chi Square Value	27739	95% Jackknife UCL	0.0343
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	8.711	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.47	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.035
		97.5% Chebyshev(Mean, Sd) UCl	0.0355
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0366
95% Approximate Gamma UCL	0.0343		
95% Adjusted Gamma UCL	0.0343		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0343
	or 95% Modified-t UCL	0.0343

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	181-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	17.5	Minimum of Log Data	2.862
Maximum	31.2	Maximum of Log Data	3.44
Mean	22.17	Mean of log Data	3.095
Median	22.17	SD of log Data	0.0903
SD	2.13		
Coefficient of Variation	0.0961		
Skewness	2.281		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.428	Shapiro Wilk Test Statistic	0.453
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.85	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23.82
95% Adjusted-CLT UCL (Chen-1995)	23.01	97.5% Chebyshev (MVUE) UCL	24.53
95% Modified-t UCL (Johnson-1978)	22.88	99% Chebyshev (MVUE) UCL	25.93

Gamma Distribution Test		Data Distribution
k star (bias corrected)	109.9	Data do not follow a Discernable Distribution (0.05)
Theta Star	0.202	
MLE of Mean	22.17	
MLE of Standard Deviation	2.115	
nu star	6153	
Approximate Chi Square Value (.05)	5971	Nonparametric Statistics
Adjusted Level of Significance	0.0404	95% CLT UCL 22.83
Adjusted Chi Square Value	5960	95% Jackknife UCL 22.85
		95% Standard Bootstrap UCL 22.83
Anderson-Darling Test Statistic	7.71	95% Bootstrap-t UCL 23.02
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL 26.76
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL 22.81
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL 23.13
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 23.92
		97.5% Chebyshev(Mean, Sd) UCL 24.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 26.17
95% Approximate Gamma UCL	22.84	
95% Adjusted Gamma UCL	22.88	

Potential UCL to Use		
	Use 95% Student's-t UCL	22.85
	or 95% Modified-t UCL	22.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	1.86	Minimum of Log Data	0.621
Maximum	9.36	Maximum of Log Data	2.236
Mean	4.907	Mean of log Data	1.567
Median	4.907	SD of log Data	0.232
SD	1.073		
Coefficient of Variation	0.219		
Skewness	1.848		

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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.432	Shapiro Wilk Test Statistic	0.44
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.252	95% H-UCL	5.327
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.868
95% Adjusted-CLT UCL (Chen-1995)	5.316	97.5% Chebyshev (MVUE) UCL	6.279
95% Modified-t UCL (Johnson-1978)	5.264	99% Chebyshev (MVUE) UCL	7.087

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.05	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.258		
MLE of Mean	4.907		
MLE of Standard Deviation	1.124		
nu star	1067		
Approximate Chi Square Value (.05)	992.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	5.24
Adjusted Chi Square Value	987.7	95% Jackknife UCL	5.252
		95% Standard Bootstrap UCL	5.25
Anderson-Darling Test Statistic	7.691	95% Bootstrap-t UCL	5.272
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	6.4
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	5.225
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	5.275
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.791
		97.5% Chebyshev(Mean, Sd) UCL	6.173
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.925
95% Approximate Gamma UCL	5.277		
95% Adjusted Gamma UCL	5.3		

Potential UCL to Use		
	Use 95% Student's-t UCL	5.252
	or 95% Modified-t UCL	5.264

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	28	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0285	Minimum of Log Data	-3.557
Maximum	0.0391	Maximum of Log Data	-3.241
Mean	0.0338	Mean of log Data	-3.387
Median	0.0338	SD of log Data	0.0431
SD	0.00144		
Coefficient of Variation	0.0427		
Skewness	2.35E-14		

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.375	Shapiro Wilk Test Statistic	0.372
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0343	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.035
95% Adjusted-CLT UCL (Chen-1995)	0.0343	97.5% Chebyshev (MVUE) UCL	0.0356
95% Modified-t UCL (Johnson-1978)	0.0343	99% Chebyshev (MVUE) UCL	0.0366

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	502.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.73E-05		
MLE of Mean	0.0338		
MLE of Standard Deviation	0.00151		
nu star	28152		
Approximate Chi Square Value (.05)	27763	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	0.0343
Adjusted Chi Square Value	27739	95% Jackknife UCL	0.0343
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	8.711	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.47	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.035
		97.5% Chebyshev(Mean, Sd) UCL	0.0355
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0366
95% Approximate Gamma UCL	0.0343		
95% Adjusted Gamma UCL	0.0343		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0343
	or 95% Modified-t UCL	0.0343

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	16.88	Maximum of Log Data	2.826
Mean	9.653	Mean of log Data	2.201
Median	11	SD of log Data	0.392
SD	3.59		
Coefficient of Variation	0.372		
Skewness	0.48		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.73	95% H-UCL	12.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.98
95% Adjusted-CLT UCL (Chen-1995)	11.7	97.5% Chebyshev (MVUE) UCL	17.27
95% Modified-t UCL (Johnson-1978)	11.76	99% Chebyshev (MVUE) UCL	21.77

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.478	Data appear Normal at 5% Significance Level	
Theta Star	1.762		
MLE of Mean	9.653		
MLE of Standard Deviation	4.124		
nu star	109.6		
Approximate Chi Square Value (.05)	86.39	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	11.52
Adjusted Chi Square Value	82.82	95% Jackknife UCL	11.73
		95% Standard Bootstrap UCL	11.41
Anderson-Darling Test Statistic	0.655	95% Bootstrap-t UCL	11.79
Anderson-Darling 5% Critical Value	0.727	95% Hall's Bootstrap UCL	12.07
Kolmogorov-Smirnov Test Statistic	0.288	95% Percentile Bootstrap UCL	11.54
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	11.63
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.6
		97.5% Chebyshev(Mean, Sd) UCL	16.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.95
95% Approximate Gamma UCL	12.24		
95% Adjusted Gamma UCL	12.77		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.039	Minimum of Log Data	-3.244
Maximum	0.44	Maximum of Log Data	-0.821
Mean	0.24	Mean of log Data	-1.55
Median	0.24	SD of log Data	0.625
SD	0.0945		
Coefficient of Variation	0.395		
Skewness	5.71E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.659	Shapiro Wilk Test Statistic	0.55
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.294	95% H-UCL	0.426
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.476
95% Adjusted-CLT UCL (Chen-1995)	0.289	97.5% Chebyshev (MVUE) UCL	0.572
95% Modified-t UCL (Johnson-1978)	0.294	99% Chebyshev (MVUE) UCL	0.762

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.079	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0778		
MLE of Mean	0.24		
MLE of Standard Deviation	0.136		
nu star	61.57		
Approximate Chi Square Value (.05)	44.53	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.289
Adjusted Chi Square Value	42.02	95% Jackknife UCL	0.294
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.202	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.268	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.37
		97.5% Chebyshev(Mean, Sd) UCL	0.426
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.537
95% Approximate Gamma UCL	0.331		
95% Adjusted Gamma UCL	0.351		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	32.58	Minimum of Log Data	3.484
Maximum	85	Maximum of Log Data	4.443
Mean	49.35	Mean of log Data	3.858
Median	47.17	SD of log Data	0.295
SD	15.84		
Coefficient of Variation	0.321		
Skewness	1.319		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.89	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	58.53	95% H-UCL	60.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	69.42
95% Adjusted-CLT UCL (Chen-1995)	59.82	97.5% Chebyshev (MVUE) UCL	78.15
95% Modified-t UCL (Johnson-1978)	58.88	99% Chebyshev (MVUE) UCL	95.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.671	Data appear Normal at 5% Significance Level	
Theta Star	5.691		
MLE of Mean	49.35		
MLE of Standard Deviation	16.76		
nu star	173.4		
Approximate Chi Square Value (.05)	144	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	57.58
Adjusted Chi Square Value	139.3	95% Jackknife UCL	58.53
		95% Standard Bootstrap UCL	57.18
Anderson-Darling Test Statistic	0.29	95% Bootstrap-t UCL	62.67
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	72.87
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	57.71
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	59.53
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	71.18
		97.5% Chebyshev(Mean, Sd) UCL	80.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	99.18
95% Approximate Gamma UCL	59.44		
95% Adjusted Gamma UCL	61.43		

Potential UCL to Use		Use 95% Student's-t UCL	58.53

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	7.6	Minimum of Log Data	2.028
Maximum	99.99	Maximum of Log Data	4.605
Mean	65.81	Mean of log Data	4.04
Median	65	SD of log Data	0.73
SD	24.5		
Coefficient of Variation	0.372		
Skewness	-1.394		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.601
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	80.01	95% H-UCL	139.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	146.5
95% Adjusted-CLT UCL (Chen-1995)	74.9	97.5% Chebyshev (MVUE) UCL	178.9
95% Modified-t UCL (Johnson-1978)	79.44	99% Chebyshev (MVUE) UCL	242.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.567	Data appear Normal at 5% Significance Level	
Theta Star	25.63		
MLE of Mean	65.81		
MLE of Standard Deviation	41.07		
nu star	51.34		
Approximate Chi Square Value (.05)	35.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	78.55
Adjusted Chi Square Value	33.65	95% Jackknife UCL	80.01
		95% Standard Bootstrap UCL	78.07
Anderson-Darling Test Statistic	1.411	95% Bootstrap-t UCL	76.45
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	76.74
Kolmogorov-Smirnov Test Statistic	0.361	95% Percentile Bootstrap UCL	76.88
Kolmogorov-Smirnov 5% Critical Value	0.268	95% BCA Bootstrap UCL	75.32
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	99.58
		97.5% Chebyshev(Mean, Sd) UCL	114.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	142.9
95% Approximate Gamma UCL	94.15		
95% Adjusted Gamma UCL	100.4		

Potential UCL to Use		Use 95% Student's-t UCL	80.01

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	10	Maximum of Log Data	2.303
Mean	6.948	Mean of log Data	0.606
Median	10	SD of log Data	2.718
SD	4.773		
Coefficient of Variation	0.687		
Skewness	-1.029		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.613	Shapiro Wilk Test Statistic	0.61
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.715	95% H-UCL	48422
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	123.2
95% Adjusted-CLT UCL (Chen-1995)	8.906	97.5% Chebyshev (MVUE) UCL	164.8
95% Modified-t UCL (Johnson-1978)	9.633	99% Chebyshev (MVUE) UCL	246.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.403	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.26		
MLE of Mean	6.948		
MLE of Standard Deviation	10.95		
nu star	8.052		
Approximate Chi Square Value (.05)	2.765	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	9.431
Adjusted Chi Square Value	2.256	95% Jackknife UCL	9.715
		95% Standard Bootstrap UCL	9.25
Anderson-Darling Test Statistic	2.297	95% Bootstrap-t UCL	8.863
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	8.581
Kolmogorov-Smirnov Test Statistic	0.456	95% Percentile Bootstrap UCL	9.003
Kolmogorov-Smirnov 5% Critical Value	0.282	95% BCA Bootstrap UCL	8.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.53
		97.5% Chebyshev(Mean, Sd) UCL	16.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.97
95% Approximate Gamma UCL	20.23		
95% Adjusted Gamma UCL	24.8		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	21.97
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	0.42	Maximum of Log Data	-0.868
Mean	0.257	Mean of log Data	-1.402
Median	0.257	SD of log Data	0.324
SD	0.0734		
Coefficient of Variation	0.286		
Skewness	0.421		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.694	Shapiro Wilk Test Statistic	0.661
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.299	95% H-UCL	0.322
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.374
95% Adjusted-CLT UCL (Chen-1995)	0.298	97.5% Chebyshev (MVUE) UCL	0.425
95% Modified-t UCL (Johnson-1978)	0.3	99% Chebyshev (MVUE) UCL	0.523

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.476	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0303		
MLE of Mean	0.257		
MLE of Standard Deviation	0.0882		
nu star	169.5		
Approximate Chi Square Value (.05)	140.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.295
Adjusted Chi Square Value	135.8	95% Jackknife UCL	0.299
		95% Standard Bootstrap UCL	0.293
Anderson-Darling Test Statistic	1.816	95% Bootstrap-t UCL	0.296
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	0.322
Kolmogorov-Smirnov Test Statistic	0.362	95% Percentile Bootstrap UCL	0.291
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	0.304
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.358
		97.5% Chebyshev(Mean, Sd) UCL	0.402
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.488
95% Approximate Gamma UCL	0.31		
95% Adjusted Gamma UCL	0.32		

Potential UCL to Use		Use 95% Student's-t UCL	0.299
		or 95% Modified-t UCL	0.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0071	Minimum of Log Data	-4.948
Maximum	0.02	Maximum of Log Data	-3.912
Mean	0.0136	Mean of log Data	-4.327
Median	0.0136	SD of log Data	0.25
SD	0.00304		
Coefficient of Variation	0.224		
Skewness	-1.57E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.659	Shapiro Wilk Test Statistic	0.628
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0153	95% H-UCL	0.016
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0183
95% Adjusted-CLT UCL (Chen-1995)	0.0151	97.5% Chebyshev (MVUE) UCL	0.0203
95% Modified-t UCL (Johnson-1978)	0.0153	99% Chebyshev (MVUE) UCL	0.0243

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.82E-04		
MLE of Mean	0.0136		
MLE of Standard Deviation	0.00365		
nu star	276.1		
Approximate Chi Square Value (.05)	238.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0151
Adjusted Chi Square Value	232.5	95% Jackknife UCL	0.0153
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.053	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0177
		97.5% Chebyshev(Mean, Sd) UCL	0.0196
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0231
95% Approximate Gamma UCL	0.0157		
95% Adjusted Gamma UCL	0.0161		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0153
	or 95% Modified-t UCL	0.0153

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options			
From File	195-02.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Chromium

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	34.78	Minimum of Log Data	3.549
Maximum	85	Maximum of Log Data	4.443
Mean	48.63	Mean of log Data	3.855
Median	44.74	SD of log Data	0.243
SD	13.77		
Coefficient of Variation	0.283		
Skewness	2.063		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.788	Shapiro Wilk Test Statistic	0.885
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	56.15	95% H-UCL	56.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64.09
95% Adjusted-CLT UCL (Chen-1995)	58.22	97.5% Chebyshev (MVUE) UCL	70.84
95% Modified-t UCL (Johnson-1978)	56.58	99% Chebyshev (MVUE) UCL	84.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.45	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.905		
MLE of Mean	48.63		
MLE of Standard Deviation	13.78		
nu star	274		
Approximate Chi Square Value (.05)	236.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	55.46
Adjusted Chi Square Value	231	95% Jackknife UCL	56.15
		95% Standard Bootstrap UCL	55.21
Anderson-Darling Test Statistic	0.628	95% Bootstrap-t UCL	63.3
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	86.71
Kolmogorov-Smirnov Test Statistic	0.222	95% Percentile Bootstrap UCL	56.06
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	58.42
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.73
		97.5% Chebyshev(Mean, Sd) UCL	74.56
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	89.95
95% Approximate Gamma UCL	56.3		
95% Adjusted Gamma UCL	57.68		

Potential UCL to Use		Use 95% Approximate Gamma UCL	56.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.032	Minimum of Log Data	-3.442
Maximum	10	Maximum of Log Data	2.303
Mean	8.142	Mean of log Data	1.301
Median	10	SD of log Data	2.219
SD	4.007		
Coefficient of Variation	0.492		
Skewness	-1.916		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.504	Shapiro Wilk Test Statistic	0.5
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.33	95% H-UCL	2278
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.6
95% Adjusted-CLT UCL (Chen-1995)	9.384	97.5% Chebyshev (MVUE) UCL	135.9
95% Modified-t UCL (Johnson-1978)	10.22	99% Chebyshev (MVUE) UCL	201.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.607	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.41		
MLE of Mean	8.142		
MLE of Standard Deviation	10.45		
nu star	13.36		
Approximate Chi Square Value (.05)	6.135	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	10.13
Adjusted Chi Square Value	5.357	95% Jackknife UCL	10.33
		95% Standard Bootstrap UCL	9.96
Anderson-Darling Test Statistic	3.252	95% Bootstrap-t UCL	9.598
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	9.38
Kolmogorov-Smirnov Test Statistic	0.517	95% Percentile Bootstrap UCL	9.905
Kolmogorov-Smirnov 5% Critical Value	0.265	95% BCA Bootstrap UCL	9.096
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.41
		97.5% Chebyshev(Mean, Sd) UCL	15.69
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.16
95% Approximate Gamma UCL	17.73		
95% Adjusted Gamma UCL	20.3		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.16

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.007	Minimum of Log Data	-4.962
Maximum	0.0268	Maximum of Log Data	-3.619
Mean	0.0169	Mean of log Data	-4.119
Median	0.0169	SD of log Data	0.312
SD	0.00443		
Coefficient of Variation	0.262		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.581
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0193	95% H-UCL	0.0207
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.024
95% Adjusted-CLT UCL (Chen-1995)	0.0191	97.5% Chebyshev (MVUE) UCL	0.0271
95% Modified-t UCL (Johnson-1978)	0.0193	99% Chebyshev (MVUE) UCL	0.0331

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.697	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00174		
MLE of Mean	0.0169		
MLE of Standard Deviation	0.00543		
nu star	213.3		
Approximate Chi Square Value (.05)	180.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	0.0191
Adjusted Chi Square Value	175.6	95% Jackknife UCL	0.0193
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.426	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.446	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0227
		97.5% Chebyshev(Mean, Sd) UCL	0.0252
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0302
95% Approximate Gamma UCL	0.02		
95% Adjusted Gamma UCL	0.0205		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0193
	or 95% Modified-t UCL	0.0193

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	6.95	Minimum of Log Data	1.939
Maximum	11.08	Maximum of Log Data	2.405
Mean	9.942	Mean of log Data	2.282
Median	11	SD of log Data	0.186
SD	1.669		
Coefficient of Variation	0.168		
Skewness	-1.196		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.686	Shapiro Wilk Test Statistic	0.68
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.85	95% H-UCL	11.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.39
95% Adjusted-CLT UCL (Chen-1995)	10.58	97.5% Chebyshev (MVUE) UCL	13.45
95% Modified-t UCL (Johnson-1978)	10.82	99% Chebyshev (MVUE) UCL	15.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	24.94	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.399		
MLE of Mean	9.942		
MLE of Standard Deviation	1.991		
nu star	548.7		
Approximate Chi Square Value (.05)	495.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	10.77
Adjusted Chi Square Value	487.1	95% Jackknife UCL	10.85
		95% Standard Bootstrap UCL	10.72
Anderson-Darling Test Statistic	1.759	95% Bootstrap-t UCL	10.69
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	10.58
Kolmogorov-Smirnov Test Statistic	0.381	95% Percentile Bootstrap UCL	10.66
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	10.57
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.14
		97.5% Chebyshev(Mean, Sd) UCL	13.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.95
95% Approximate Gamma UCL	11.01		
95% Adjusted Gamma UCL	11.2		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.85
	or 95% Modified-t UCL	10.82

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	12.5	Minimum of Log Data	2.526
Maximum	85	Maximum of Log Data	4.443
Mean	43	Mean of log Data	3.672
Median	39.09	SD of log Data	0.473
SD	18.06		
Coefficient of Variation	0.42		
Skewness	0.932		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.892
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	52.87	95% H-UCL	60.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.05
95% Adjusted-CLT UCL (Chen-1995)	53.59	97.5% Chebyshev (MVUE) UCL	82.98
95% Modified-t UCL (Johnson-1978)	53.13	99% Chebyshev (MVUE) UCL	106.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.248	Data appear Normal at 5% Significance Level	
Theta Star	10.12		
MLE of Mean	43		
MLE of Standard Deviation	20.86		
nu star	93.45		
Approximate Chi Square Value (.05)	72.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	51.96
Adjusted Chi Square Value	69.11	95% Jackknife UCL	52.87
		95% Standard Bootstrap UCL	51.61
Anderson-Darling Test Statistic	0.414	95% Bootstrap-t UCL	55.58
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	62.39
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	51.63
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	53.65
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.74
		97.5% Chebyshev(Mean, Sd) UCL	77.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	97.18
95% Approximate Gamma UCL	55.69		
95% Adjusted Gamma UCL	58.15		

Potential UCL to Use	Use 95% Student's-t UCL	52.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	127.5	Minimum of Log Data	4.848
Maximum	1137	Maximum of Log Data	7.036
Mean	335.1	Mean of log Data	5.63
Median	228.4	SD of log Data	0.567
SD	278.2		
Coefficient of Variation	0.83		
Skewness	2.823		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	487.1	95% H-UCL	491.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	568.5
95% Adjusted-CLT UCL (Chen-1995)	549.3	97.5% Chebyshev (MVUE) UCL	675.1
95% Modified-t UCL (Johnson-1978)	499	99% Chebyshev (MVUE) UCL	884.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.148	Data Follow Appr. Gamma Distribution at 5% Significance Leve	
Theta Star	156		
MLE of Mean	335.1		
MLE of Standard Deviation	228.7		
nu star	47.25		
Approximate Chi Square Value (.05)	32.48	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	473.1
Adjusted Chi Square Value	30.49	95% Jackknife UCL	487.1
		95% Standard Bootstrap UCL	467
Anderson-Darling Test Statistic	0.962	95% Bootstrap-t UCL	761.3
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	1008
Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	486.4
Kolmogorov-Smirnov 5% Critical Value	0.257	95% BCA Bootstrap UCL	568.9
Data follow Appr. Gamma Distribution at 5% Significance Lev		95% Chebyshev(Mean, Sd) UCL	700.7
		97.5% Chebyshev(Mean, Sd) UCL	858.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1170
95% Approximate Gamma UCL	487.6		
95% Adjusted Gamma UCL	519.3		

Potential UCL to Use	Use 95% Approximate Gamma UCL	487.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	12.8	Minimum of Log Data	2.549
Maximum	102.4	Maximum of Log Data	4.628
Mean	66.42	Mean of log Data	4.102
Median	65	SD of log Data	0.544
SD	22.76		
Coefficient of Variation	0.343		
Skewness	-0.796		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.738	Shapiro Wilk Test Statistic	0.582
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	78.86	95% H-UCL	102.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	119.6
95% Adjusted-CLT UCL (Chen-1995)	75.95	97.5% Chebyshev (MVUE) UCL	141.4
95% Modified-t UCL (Johnson-1978)	78.58	99% Chebyshev (MVUE) UCL	184.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.036	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.46		
MLE of Mean	66.42		
MLE of Standard Deviation	33.06		
nu star	88.78		
Approximate Chi Square Value (.05)	68.06	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	77.71
Adjusted Chi Square Value	65.11	95% Jackknife UCL	78.86
		95% Standard Bootstrap UCL	77.4
Anderson-Darling Test Statistic	1.925	95% Bootstrap-t UCL	78.76
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	80.83
Kolmogorov-Smirnov Test Statistic	0.412	95% Percentile Bootstrap UCL	77.13
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	75.19
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	96.34
		97.5% Chebyshev(Mean, Sd) UCL	109.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.7
95% Approximate Gamma UCL	86.64		
95% Adjusted Gamma UCL	90.57		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	96.34

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0042	Minimum of Log Data	-5.473
Maximum	0.0406	Maximum of Log Data	-3.204
Mean	0.0224	Mean of log Data	-3.897
Median	0.0224	SD of log Data	0.552
SD	0.00814		
Coefficient of Variation	0.363		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.529
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0268	95% H-UCL	0.035
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0406
95% Adjusted-CLT UCL (Chen-1995)	0.0264	97.5% Chebyshev (MVUE) UCL	0.0481
95% Modified-t UCL (Johnson-1978)	0.0268	99% Chebyshev (MVUE) UCL	0.0628

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.884	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00577		
MLE of Mean	0.0224		
MLE of Standard Deviation	0.0114		
nu star	85.45		
Approximate Chi Square Value (.05)	65.14	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	0.0264
Adjusted Chi Square Value	62.25	95% Jackknife UCL	0.0268
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.53	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0331
		97.5% Chebyshev(Mean, Sd) UCL	0.0377
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0468
95% Approximate Gamma UCL	0.0294		
95% Adjusted Gamma UCL	0.0307		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0331

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	11	Maximum of Log Data	2.398
Mean	9.025	Mean of log Data	2.165
Median	10.61	SD of log Data	0.286
SD	2.31		
Coefficient of Variation	0.256		
Skewness	-0.607		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.08	95% H-UCL	10.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.99
95% Adjusted-CLT UCL (Chen-1995)	9.906	97.5% Chebyshev (MVUE) UCL	13.27
95% Modified-t UCL (Johnson-1978)	10.06	99% Chebyshev (MVUE) UCL	15.77

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.787		
MLE of Mean	9.025		
MLE of Standard Deviation	2.666		
nu star	343.8		
Approximate Chi Square Value (.05)	301.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.01
Adjusted Chi Square Value	297	95% Jackknife UCL	10.08
		95% Standard Bootstrap UCL	9.953
Anderson-Darling Test Statistic	1.351	95% Bootstrap-t UCL	9.974
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	9.883
Kolmogorov-Smirnov Test Statistic	0.296	95% Percentile Bootstrap UCL	9.955
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9.929
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.62
		97.5% Chebyshev(Mean, Sd) UCL	12.75
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.96
95% Approximate Gamma UCL	10.28		
95% Adjusted Gamma UCL	10.45		

Potential UCL to Use		Use 95% Student's-t UCL	10.08
		or 95% Modified-t UCL	10.06

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	31.26	Minimum of Log Data	3.442
Maximum	85	Maximum of Log Data	4.443
Mean	44.48	Mean of log Data	3.759
Median	42.91	SD of log Data	0.266
SD	13.76		
Coefficient of Variation	0.309		
Skewness	1.963		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.808	Shapiro Wilk Test Statistic	0.906
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	50.74	95% H-UCL	50.73
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	57.75
95% Adjusted-CLT UCL (Chen-1995)	52.25	97.5% Chebyshev (MVUE) UCL	63.56
95% Modified-t UCL (Johnson-1978)	51.04	99% Chebyshev (MVUE) UCL	74.96

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.21	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.97		
MLE of Mean	44.48		
MLE of Standard Deviation	13.29		
nu star	336.2		
Approximate Chi Square Value (.05)	294.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	50.33
Adjusted Chi Square Value	289.9	95% Jackknife UCL	50.74
		95% Standard Bootstrap UCL	50.17
Anderson-Darling Test Statistic	0.564	95% Bootstrap-t UCL	53.84
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	76.04
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	50.53
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	52.44
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	59.97
		97.5% Chebyshev(Mean, Sd) UCL	66.67
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	79.83
95% Approximate Gamma UCL	50.75		
95% Adjusted Gamma UCL	51.58		

Potential UCL to Use		Use 95% Approximate Gamma UCL	50.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	86.9	Maximum of Log Data	4.465
Mean	56.32	Mean of log Data	3.847
Median	65	SD of log Data	0.758
SD	24.32		
Coefficient of Variation	0.432		
Skewness	-1.35		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.687	Shapiro Wilk Test Statistic	0.596
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.38	95% H-UCL	101.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.1
95% Adjusted-CLT UCL (Chen-1995)	64.31	97.5% Chebyshev (MVUE) UCL	140
95% Modified-t UCL (Johnson-1978)	67.02	99% Chebyshev (MVUE) UCL	186.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.336	Data do not follow a Discernable Distribution (0.05)	
Theta Star	24.11		
MLE of Mean	56.32		
MLE of Standard Deviation	36.85		
nu star	70.09		
Approximate Chi Square Value (.05)	51.82	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	66.65
Adjusted Chi Square Value	49.89	95% Jackknife UCL	67.38
		95% Standard Bootstrap UCL	66.31
Anderson-Darling Test Statistic	3.067	95% Bootstrap-t UCL	65.53
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	64.32
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	66.15
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	64.59
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.69
		97.5% Chebyshev(Mean, Sd) UCL	95.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	118.8
95% Approximate Gamma UCL	76.18		
95% Adjusted Gamma UCL	79.13		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCI	83.69

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.025	Minimum of Log Data	-3.689
Maximum	10	Maximum of Log Data	2.303
Mean	7.262	Mean of log Data	0.767
Median	10	SD of log Data	2.617
SD	4.523		
Coefficient of Variation	0.623		
Skewness	-1.16		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.586	Shapiro Wilk Test Statistic	0.577
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.319	95% H-UCL	3800
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	143.4
95% Adjusted-CLT UCL (Chen-1995)	8.809	97.5% Chebyshev (MVUE) UCL	190.8
95% Modified-t UCL (Johnson-1978)	9.261	99% Chebyshev (MVUE) UCL	284.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.78		
MLE of Mean	7.262		
MLE of Standard Deviation	10.71		
nu star	13.8		
Approximate Chi Square Value (.05)	6.436	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9.183
Adjusted Chi Square Value	5.827	95% Jackknife UCL	9.319
		95% Standard Bootstrap UCL	9.111
Anderson-Darling Test Statistic	3.695	95% Bootstrap-t UCL	9.037
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	8.732
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	9.096
Kolmogorov-Smirnov 5% Critical Value	0.234	95% BCA Bootstrap UCL	8.671
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.35
		97.5% Chebyshev(Mean, Sd) UCL	14.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.88
95% Approximate Gamma UCL	15.57		
95% Adjusted Gamma UCL	17.2		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCI	18.88
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.27	Minimum of Log Data	-1.309
Maximum	0.42	Maximum of Log Data	-0.868
Mean	0.325	Mean of log Data	-1.128
Median	0.325	SD of log Data	0.0899
SD	0.0308		
Coefficient of Variation	0.0948		
Skewness	1.824		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.61	Shapiro Wilk Test Statistic	0.64
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.339	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.358
95% Adjusted-CLT UCL (Chen-1995)	0.342	97.5% Chebyshev (MVUE) UCL	0.372
95% Modified-t UCL (Johnson-1978)	0.34	99% Chebyshev (MVUE) UCL	0.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	102.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00316		
MLE of Mean	0.325		
MLE of Standard Deviation	0.032		
nu star	3086		
Approximate Chi Square Value (.05)	2958	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.338
Adjusted Chi Square Value	2943	95% Jackknife UCL	0.339
		95% Standard Bootstrap UCL	0.338
Anderson-Darling Test Statistic	2.836	95% Bootstrap-t UCL	0.342
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	0.413
Kolmogorov-Smirnov Test Statistic	0.422	95% Percentile Bootstrap UCL	0.338
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	0.341
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.36
		97.5% Chebyshev(Mean, Sd) UCL	0.375
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.404
95% Approximate Gamma UCL	0.339		
95% Adjusted Gamma UCL	0.341		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.339
	or 95% Modified-t UCL	0.34

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options			
From File	195-05.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	6.12	Minimum of Log Data	1.812
Maximum	11	Maximum of Log Data	2.398
Mean	9.422	Mean of log Data	2.216
Median	11	SD of log Data	0.253
SD	2.156		
Coefficient of Variation	0.229		
Skewness	-0.794		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.716	Shapiro Wilk Test Statistic	0.718
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.67	95% H-UCL	11.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.75
95% Adjusted-CLT UCL (Chen-1995)	10.36	97.5% Chebyshev (MVUE) UCL	14.19
95% Modified-t UCL (Johnson-1978)	10.64	99% Chebyshev (MVUE) UCL	17

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.13	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.718		
MLE of Mean	9.422		
MLE of Standard Deviation	2.6		
nu star	262.6		
Approximate Chi Square Value (.05)	226.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	10.54
Adjusted Chi Square Value	220.2	95% Jackknife UCL	10.67
		95% Standard Bootstrap UCL	10.43
Anderson-Darling Test Statistic	1.417	95% Bootstrap-t UCL	10.6
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	10.3
Kolmogorov-Smirnov Test Statistic	0.377	95% Percentile Bootstrap UCL	10.38
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	10.31
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.39
		97.5% Chebyshev(Mean, Sd) UCL	13.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.21
95% Approximate Gamma UCL	10.94		
95% Adjusted Gamma UCL	11.24		

Potential UCL to Use		Use 95% Student's-t UCL	10.67
		or 95% Modified-t UCL	10.64

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cesium-137 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	32.34	Minimum of Log Data	3.476
Maximum	85	Maximum of Log Data	4.443
Mean	53.85	Mean of log Data	3.939
Median	50.49	SD of log Data	0.317
SD	18.15		
Coefficient of Variation	0.337		
Skewness	1.012		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.37	95% H-UCL	66.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.44
95% Adjusted-CLT UCL (Chen-1995)	65.25	97.5% Chebyshev (MVUE) UCL	87.69
95% Modified-t UCL (Johnson-1978)	64.67	99% Chebyshev (MVUE) UCL	107.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.633	Data appear Normal at 5% Significance Level	
Theta Star	7.054		
MLE of Mean	53.85		
MLE of Standard Deviation	19.49		
nu star	152.7		
Approximate Chi Square Value (.05)	125.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	63.29
Adjusted Chi Square Value	120.8	95% Jackknife UCL	64.37
		95% Standard Bootstrap UCL	62.79
Anderson-Darling Test Statistic	0.448	95% Bootstrap-t UCL	70.19
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	91.03
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	63.04
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	64.22
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.86
		97.5% Chebyshev(Mean, Sd) UCL	89.69
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111
95% Approximate Gamma UCL	65.71		
95% Adjusted Gamma UCL	68.07		

Potential UCL to Use		Use 95% Student's-t UCL	64.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	12.4	Minimum of Log Data	2.518
Maximum	81.1	Maximum of Log Data	4.396
Mean	61.35	Mean of log Data	4.031
Median	65	SD of log Data	0.536
SD	17.93		
Coefficient of Variation	0.292		
Skewness	-2.632		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.537	Shapiro Wilk Test Statistic	0.449
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.74	95% H-UCL	97.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	112.2
95% Adjusted-CLT UCL (Chen-1995)	65.63	97.5% Chebyshev (MVUE) UCL	133.1
95% Modified-t UCL (Johnson-1978)	70.96	99% Chebyshev (MVUE) UCL	174.1

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	4.262	Data do not follow a Discernable Distribution (0.05)		
Theta Star	14.4			
MLE of Mean	61.35			
MLE of Standard Deviation	29.72			
nu star	85.23			
Approximate Chi Square Value (.05)	64.95	Nonparametric Statistics		
Adjusted Level of Significance	0.0267	95% CLT UCL		70.68
Adjusted Chi Square Value	61.88	95% Jackknife UCL		71.74
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.51	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		86.06
		97.5% Chebyshev(Mean, Sd) UCL		96.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		117.8
95% Approximate Gamma UCL	80.51			
95% Adjusted Gamma UCL	84.5			

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	86.06

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.032	Minimum of Log Data	-3.442
Maximum	10	Maximum of Log Data	2.303
Mean	8.844	Mean of log Data	1.711
Median	10	SD of log Data	1.811
SD	3.136		
Coefficient of Variation	0.355		
Skewness	-3.025		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.44	Shapiro Wilk Test Statistic	0.381
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.66	95% H-UCL	563.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	74.78
95% Adjusted-CLT UCL (Chen-1995)	9.462	97.5% Chebyshev (MVUE) UCL	98.15
95% Modified-t UCL (Johnson-1978)	10.5	99% Chebyshev (MVUE) UCL	144.1

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.911	Data do not follow a Discernable Distribution (0.05)		
Theta Star	9.713			
MLE of Mean	8.844			
MLE of Standard Deviation	9.268			
nu star	18.21			
Approximate Chi Square Value (.05)	9.544	Nonparametric Statistics		
Adjusted Level of Significance	0.0267	95% CLT UCL		10.48
Adjusted Chi Square Value	8.474	95% Jackknife UCL		10.66
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.323	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.273	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		13.17
		97.5% Chebyshev(Mean, Sd) UCL		15.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		18.71
95% Approximate Gamma UCL	16.88			
95% Adjusted Gamma UCL	19.01			

Potential UCL to Use		
Recommended UCL exceeds the maximum observation	Use 99% Chebyshev (Mean, Sd) UCL	18.71

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options			
From File	195-06.wst		
Full Precision	OFF		
Confidence Coefficient		95%	
Number of Bootstrap Operations		2000	

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6
Raw Statistics		Log-transformed Statistics	
Minimum	4.4	Minimum of Log Data	1.482
Maximum	11	Maximum of Log Data	2.398
Mean	9.708	Mean of log Data	2.237
Median	11	SD of log Data	0.305
SD	2.288		
Coefficient of Variation	0.236		
Skewness	-1.813		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.643	Shapiro Wilk Test Statistic	0.612
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.89	95% H-UCL	11.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.55
95% Adjusted-CLT UCL (Chen-1995)	10.42	97.5% Chebyshev (MVUE) UCL	15.19
95% Modified-t UCL (Johnson-1978)	10.84	99% Chebyshev (MVUE) UCL	18.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.64	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.912		
MLE of Mean	9.708		
MLE of Standard Deviation	2.976		
nu star	255.4		
Approximate Chi Square Value (.05)	219.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.79
Adjusted Chi Square Value	214.3	95% Jackknife UCL	10.89
		95% Standard Bootstrap UCL	10.7
Anderson-Darling Test Statistic	2.165	95% Bootstrap-t UCL	10.64
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.51
Kolmogorov-Smirnov Test Statistic	0.347	95% Percentile Bootstrap UCL	10.66
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.47
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.59
		97.5% Chebyshev(Mean, Sd) UCL	13.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.28
95% Approximate Gamma UCL	11.3		
95% Adjusted Gamma UCL	11.57		
Potential UCL to Use		Use 95% Student's-t UCL	10.89
		or 95% Modified-t UCL	10.84

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	-0.014	Log Statistics Not Avaliable
Maximum	0.298	
Mean	0.142	
Median	0.142	
SD	0.0665	
Coefficient of Variation	0.468	
Skewness	0	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.6	Not Available
Shapiro Wilk Critical Value	0.859	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.176	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.176	95% Adjusted-CLT UCL (Chen 1995)		0.174
		95% Modified-t UCL (Johnson-1978)		0.176

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.226	95% CLT UCL		0.174
		95% Jackknife UCL		0.176
		95% Standard Bootstrap UCL	N/A	
		95% Bootstrap-t UCL	N/A	
		95% Hall's Bootstrap UCL	N/A	
		95% Percentile Bootstrap UCL	N/A	
		95% BCA Bootstrap UCL	N/A	
		95% Chebyshev(Mean, Sd) UCL		0.226
		97.5% Chebyshev(Mean, Sd) UCL		0.262
		99% Chebyshev(Mean, Sd) UCL		0.333

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	30.92	Minimum of Log Data	3.431
Maximum	85	Maximum of Log Data	4.443
Mean	47.52	Mean of log Data	3.827
Median	43.2	SD of log Data	0.264
SD	########		
Coefficient of Variation	0.299		
Skewness	1.79		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	54.9	95% H-UCL	55.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	63.28
95% Adjusted-CLT UCL (Chen-1995)	56.55	97.5% Chebyshev (MVUE) UCL	70.15
95% Modified-t UCL (Johnson-1978)	55.25	99% Chebyshev (MVUE) UCL	83.65

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.05	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.302		
MLE of Mean	47.52		
MLE of Standard Deviation	14.3		
nu star	265.1		
Approximate Chi Square Value (.05)	228.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	54.28
Adjusted Chi Square Value	223.2	95% Jackknife UCL	54.9
		95% Standard Bootstrap UCL	54.13
Anderson-Darling Test Statistic	0.522	95% Bootstrap-t UCL	59.4
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	85.7
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	54.55
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	55.94
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	65.43
		97.5% Chebyshev(Mean, Sd) UCL	73.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	88.4
95% Approximate Gamma UCL	55.16		
95% Adjusted Gamma UCL	56.44		

Potential UCL to Use			
		Use 95% Approximate Gamma UCL	55.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	98.09	Maximum of Log Data	4.586
Mean	63.58	Mean of log Data	3.971
Median	65	SD of log Data	0.767
SD	27.58		
Coefficient of Variation	0.434		
Skewness	-1.1		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.644
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	77.88	95% H-UCL	127.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	139
95% Adjusted-CLT UCL (Chen-1995)	73.98	97.5% Chebyshev (MVUE) UCL	169.2
95% Modified-t UCL (Johnson-1978)	77.46	99% Chebyshev (MVUE) UCL	228.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.243	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.35		
MLE of Mean	63.58		
MLE of Standard Deviation	42.46		
nu star	53.83		
Approximate Chi Square Value (.05)	37.97	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	76.68
Adjusted Chi Square Value	35.95	95% Jackknife UCL	77.88
		95% Standard Bootstrap UCL	76.26
Anderson-Darling Test Statistic	1.822	95% Bootstrap-t UCL	76.04
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	74.09
Kolmogorov-Smirnov Test Statistic	0.426	95% Percentile Bootstrap UCL	75.82
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	74.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.29
		97.5% Chebyshev(Mean, Sd) UCL	113.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	142.8
95% Approximate Gamma UCL	90.13		
95% Adjusted Gamma UCL	95.21		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	98.29
Recommended UCL exceeds the maximum observation		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	10.01	Maximum of Log Data	2.304
Mean	8.34	Mean of log Data	1.353
Median	10	SD of log Data	2.218
SD	3.88		
Coefficient of Variation	0.465		
Skewness	-2.055		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.465	Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.35	95% H-UCL	1724
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.2
95% Adjusted-CLT UCL (Chen-1995)	9.472	97.5% Chebyshev (MVUE) UCL	145.9
95% Modified-t UCL (Johnson-1978)	10.24	99% Chebyshev (MVUE) UCL	216.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.637	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.08		
MLE of Mean	8.34		
MLE of Standard Deviation	10.45		
nu star	15.3		
Approximate Chi Square Value (.05)	7.469	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.18
Adjusted Chi Square Value	6.65	95% Jackknife UCL	10.35
		95% Standard Bootstrap UCL	10.02
Anderson-Darling Test Statistic	3.778	95% Bootstrap-t UCL	9.654
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	9.47
Kolmogorov-Smirnov Test Statistic	0.54	95% Percentile Bootstrap UCL	10
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	9.172
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.22
		97.5% Chebyshev(Mean, Sd) UCL	15.33
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.48
95% Approximate Gamma UCL	17.08		
95% Adjusted Gamma UCL	19.18		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.48

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0051	Minimum of Log Data	-5.279
Maximum	0.248	Maximum of Log Data	-1.396
Mean	0.126	Mean of log Data	-2.28
Median	0.126	SD of log Data	0.964
SD	0.0517		
Coefficient of Variation	0.409		
Skewness	########		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.442
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.153	95% H-UCL	0.373
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.355
95% Adjusted-CLT UCL (Chen-1995)	0.151	97.5% Chebyshev (MVUE) UCL	0.441
95% Modified-t UCL (Johnson-1978)	0.153	99% Chebyshev (MVUE) UCL	0.611

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.945	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.065		
MLE of Mean	0.126		
MLE of Standard Deviation	0.0906		
nu star	46.67		
Approximate Chi Square Value (.05)	31.99	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.151
Adjusted Chi Square Value	30.15	95% Jackknife UCL	0.153
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.108	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.191
		97.5% Chebyshev(Mean, Sd) UCL	0.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.275
95% Approximate Gamma UCL	0.184		
95% Adjusted Gamma UCL	0.196		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.191

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-07.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.6	Minimum of Log Data	1.887
Maximum	11	Maximum of Log Data	2.398
Mean	9.845	Mean of log Data	2.27
Median	11	SD of log Data	0.199
SD	1.769		
Coefficient of Variation	0.18		
Skewness	-1.058		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.678	Shapiro Wilk Test Statistic	0.682
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.76	95% H-UCL	11.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.33
95% Adjusted-CLT UCL (Chen-1995)	10.52	97.5% Chebyshev (MVUE) UCL	13.41
95% Modified-t UCL (Johnson-1978)	10.74	99% Chebyshev (MVUE) UCL	15.51
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	22.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.442		
MLE of Mean	9.845		
MLE of Standard Deviation	2.086		
nu star	534.7		
Approximate Chi Square Value (.05)	482	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	10.69
Adjusted Chi Square Value	474.4	95% Jackknife UCL	10.76
		95% Standard Bootstrap UCL	10.6
Anderson-Darling Test Statistic	1.949	95% Bootstrap-t UCL	10.67
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.51
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	10.58
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.55
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.07
		97.5% Chebyshev(Mean, Sd) UCL	13.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.93
95% Approximate Gamma UCL	10.92		
95% Adjusted Gamma UCL	11.1		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.76
	or 95% Modified-t UCL	10.74

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	34.18	Minimum of Log Data	3.532
Maximum	61.47	Maximum of Log Data	4.119
Mean	42.52	Mean of log Data	3.73
Median	37.53	SD of log Data	0.205
SD	9.359		
Coefficient of Variation	0.22		
Skewness	1.114		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.823	Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	47.37	95% H-UCL	47.69
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	53.47
95% Adjusted-CLT UCL (Chen-1995)	47.89	97.5% Chebyshev (MVUE) UCL	58.22
95% Modified-t UCL (Johnson-1978)	47.52	99% Chebyshev (MVUE) UCL	67.56

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.264		
MLE of Mean	42.52		
MLE of Standard Deviation	9.811		
nu star	450.7		
Approximate Chi Square Value (.05)	402.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	46.96
Adjusted Chi Square Value	395.5	95% Jackknife UCL	47.37
		95% Standard Bootstrap UCL	46.9
Anderson-Darling Test Statistic	0.868	95% Bootstrap-t UCL	49.75
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	47.93
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL	46.96
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	47.93
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	54.3
		97.5% Chebyshev(Mean, Sd) UCL	59.39
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	69.4
95% Approximate Gamma UCL	47.61		
95% Adjusted Gamma UCL	48.45		

Potential UCL to Use		
	Use 95% Student's-t UCL	47.37
	or 95% Modified-t UCL	47.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	7.3	Minimum of Log Data	1.988
Maximum	13.9	Maximum of Log Data	2.632
Mean	10.6	Mean of log Data	2.352
Median	10.6	SD of log Data	0.139
SD	1.407		
Coefficient of Variation	0.133		
Skewness	5.84E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.587
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.33	95% H-UCL	11.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.46
95% Adjusted-CLT UCL (Chen-1995)	11.27	97.5% Chebyshev (MVUE) UCL	13.26
95% Modified-t UCL (Johnson-1978)	11.33	99% Chebyshev (MVUE) UCL	14.84

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	44.32	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.239		
MLE of Mean	10.6		
MLE of Standard Deviation	1.592		
nu star	1064		
Approximate Chi Square Value (.05)	989	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.27
Adjusted Chi Square Value	978	95% Jackknife UCL	11.33
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.73	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.434	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.37
		97.5% Chebyshev(Mean, Sd) UCL	13.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.64
95% Approximate Gamma UCL	11.4		
95% Adjusted Gamma UCL	11.53		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.33
	or 95% Modified-t UCL	11.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.032	Minimum of Log Data	-3.442
Maximum	10	Maximum of Log Data	2.303
Mean	8.177	Mean of log Data	1.332
Median	10	SD of log Data	2.217
SD	3.844		
Coefficient of Variation	0.47		
Skewness	-1.97		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.524	Shapiro Wilk Test Statistic	0.478
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.17	95% H-UCL	1675
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	107.7
95% Adjusted-CLT UCL (Chen-1995)	9.328	97.5% Chebyshev (MVUE) UCL	142.5
95% Modified-t UCL (Johnson-1978)	10.07	99% Chebyshev (MVUE) UCL	211

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.637	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.84		
MLE of Mean	8.177		
MLE of Standard Deviation	10.25		
nu star	15.28		
Approximate Chi Square Value (.05)	7.458	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10
Adjusted Chi Square Value	6.64	95% Jackknife UCL	10.17
		95% Standard Bootstrap UCL	9.856
Anderson-Darling Test Statistic	3.556	95% Bootstrap-t UCL	9.661
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	9.445
Kolmogorov-Smirnov Test Statistic	0.478	95% Percentile Bootstrap UCL	9.677
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	9.17
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.01
		97.5% Chebyshev(Mean, Sd) UCL	15.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.22
95% Approximate Gamma UCL	16.76		
95% Adjusted Gamma UCL	18.82		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.22

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-08.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	8	Minimum of Log Data	2.079
Maximum	13.8	Maximum of Log Data	2.625
Mean	10.3	Mean of log Data	2.32
Median	11	SD of log Data	0.16
SD	1.651		
Coefficient of Variation	0.16		
Skewness	0.365		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.869	Shapiro Wilk Test Statistic	0.876
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.15	95% H-UCL	11.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.38
95% Adjusted-CLT UCL (Chen-1995)	11.14	97.5% Chebyshev (MVUE) UCL	13.28
95% Modified-t UCL (Johnson-1978)	11.16	99% Chebyshev (MVUE) UCL	15.06

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	32.09	Data appear Normal at 5% Significance Level	
Theta Star	0.321		
MLE of Mean	10.3		
MLE of Standard Deviation	1.818		
nu star	770.1		
Approximate Chi Square Value (.05)	706.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.08
Adjusted Chi Square Value	697.5	95% Jackknife UCL	11.15
		95% Standard Bootstrap UCL	11.06
Anderson-Darling Test Statistic	0.828	95% Bootstrap-t UCL	11.18
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	11.28
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	11.02
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.38
		97.5% Chebyshev(Mean, Sd) UCL	13.27
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.04
95% Approximate Gamma UCL	11.22		
95% Adjusted Gamma UCL	11.37		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.15

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.58	Minimum of Log Data	-0.545
Maximum	0.74	Maximum of Log Data	-0.301
Mean	0.66	Mean of log Data	-0.417
Median	0.66	SD of log Data	0.052
SD	0.0341		
Coefficient of Variation	0.0517		
Skewness	-5.96E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.598
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.678	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.703
95% Adjusted-CLT UCL (Chen-1995)	0.676	97.5% Chebyshev (MVUE) UCL	0.722
95% Modified-t UCL (Johnson-1978)	0.678	99% Chebyshev (MVUE) UCL	0.759

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	304.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00217		
MLE of Mean	0.66		
MLE of Standard Deviation	0.0378		
nu star	7301		
Approximate Chi Square Value (.05)	7103	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.676
Adjusted Chi Square Value	7074	95% Jackknife UCL	0.678
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.716	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.423	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.703
		97.5% Chebyshev(Mean, Sd) UCL	0.721
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.758
95% Approximate Gamma UCL	0.678		
95% Adjusted Gamma UCL	0.681		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.678
	or 95% Modified-t UCL	0.678

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.046	Minimum of Log Data	-3.079
Maximum	0.37	Maximum of Log Data	-0.994
Mean	0.208	Mean of log Data	-1.648
Median	0.208	SD of log Data	0.48
SD	0.0691		
Coefficient of Variation	0.332		
Skewness	-2.30E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.514
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.244	95% H-UCL	0.293
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.346
95% Adjusted-CLT UCL (Chen-1995)	0.241	97.5% Chebyshev (MVUE) UCL	0.403
95% Modified-t UCL (Johnson-1978)	0.244	99% Chebyshev (MVUE) UCL	0.515

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.001	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0416		
MLE of Mean	0.208		
MLE of Standard Deviation	0.093		
nu star	120		
Approximate Chi Square Value (.05)	95.72	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.241
Adjusted Chi Square Value	92.41	95% Jackknife UCL	0.244
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.86	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.295
		97.5% Chebyshev(Mean, Sd) UCL	0.333
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.406
95% Approximate Gamma UCL	0.261		
95% Adjusted Gamma UCL	0.27		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.244
	or 95% Modified-t UCL	0.244

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	17.7	Minimum of Log Data	2.874
Maximum	67.93	Maximum of Log Data	4.218
Mean	45.1	Mean of log Data	3.758
Median	43.21	SD of log Data	0.352
SD	13.83		
Coefficient of Variation	0.307		
Skewness	0.0234		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.871
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	52.27	95% H-UCL	56.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.68
95% Adjusted-CLT UCL (Chen-1995)	51.69	97.5% Chebyshev (MVUE) UCL	74.47
95% Modified-t UCL (Johnson-1978)	52.27	99% Chebyshev (MVUE) UCL	91.74

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.601	Data appear Normal at 5% Significance Level	
Theta Star	5.933		
MLE of Mean	45.1		
MLE of Standard Deviation	16.36		
nu star	182.4		
Approximate Chi Square Value (.05)	152.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	51.66
Adjusted Chi Square Value	148	95% Jackknife UCL	52.27
		95% Standard Bootstrap UCL	51.55
Anderson-Darling Test Statistic	0.533	95% Bootstrap-t UCL	52.86
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	53.37
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	51.41
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	51.25
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	62.5
		97.5% Chebyshev(Mean, Sd) UCL	70.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	84.81
95% Approximate Gamma UCL	54.06		
95% Adjusted Gamma UCL	55.6		

Potential UCL to Use		Use 95% Student's-t UCL	52.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	7.6	Minimum of Log Data	2.028
Maximum	18.2	Maximum of Log Data	2.901
Mean	12.9	Mean of log Data	2.542
Median	12.9	SD of log Data	0.19
SD	2.26		
Coefficient of Variation	0.175		
Skewness	-1.34E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.578
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.07	95% H-UCL	14.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.01
95% Adjusted-CLT UCL (Chen-1995)	13.97	97.5% Chebyshev (MVUE) UCL	17.34
95% Modified-t UCL (Johnson-1978)	14.07	99% Chebyshev (MVUE) UCL	19.97

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	24.52	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.526		
MLE of Mean	12.9		
MLE of Standard Deviation	2.605		
nu star	588.5		
Approximate Chi Square Value (.05)	533.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	13.97
Adjusted Chi Square Value	525.2	95% Jackknife UCL	14.07
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.742	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.74
		97.5% Chebyshev(Mean, Sd) UCL	16.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.39
95% Approximate Gamma UCL	14.24		
95% Adjusted Gamma UCL	14.45		

Potential UCL to Use		
	Use 95% Student's-t UCL	14.07
	or 95% Modified-t UCL	14.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	1.20E+01	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	159	Minimum of Log Data	5.069
Maximum	1180	Maximum of Log Data	7.073
Mean	331.6	Mean of log Data	5.615
Median	244.7	SD of log Data	0.558
SD	285		
Coefficient of Variation	0.86		
Skewness	2.837		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	479.3	95% H-UCL	465.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	544.5
95% Adjusted-CLT UCL (Chen-1995)	538.9	97.5% Chebyshev (MVUE) UCL	643.4
95% Modified-t UCL (Johnson-1978)	490.5	99% Chebyshev (MVUE) UCL	837.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.154	Data do not follow a Discernable Distribution (0.05)	
Theta Star	153.9		
MLE of Mean	331.6		
MLE of Standard Deviation	225.9		
nu star	51.7		
Approximate Chi Square Value (.05)	36.18	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	466.9
Adjusted Chi Square Value	34.21	95% Jackknife UCL	479.3
		95% Standard Bootstrap UCL	460.6
Anderson-Darling Test Statistic	1.413	95% Bootstrap-t UCL	1020
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1175
Kolmogorov-Smirnov Test Statistic	0.308	95% Percentile Bootstrap UCL	484.6
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	541.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	690.2
		97.5% Chebyshev(Mean, Sd) UCL	845.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1150
95% Approximate Gamma UCL	473.7		
95% Adjusted Gamma UCL	501		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	690.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	12.4	Minimum of Log Data	2.518
Maximum	91.1	Maximum of Log Data	4.512
Mean	60.73	Mean of log Data	3.986
Median	65	SD of log Data	0.605
SD	22.69		
Coefficient of Variation	0.374		
Skewness	-1.381		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.633
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.49	95% H-UCL	97.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	113.5
95% Adjusted-CLT UCL (Chen-1995)	68.71	97.5% Chebyshev (MVUE) UCL	135.2
95% Modified-t UCL (Johnson-1978)	72.06	99% Chebyshev (MVUE) UCL	177.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.29	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.46		
MLE of Mean	60.73		
MLE of Standard Deviation	33.48		
nu star	78.95		
Approximate Chi Square Value (.05)	59.48	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	71.5
Adjusted Chi Square Value	56.91	95% Jackknife UCL	72.49
		95% Standard Bootstrap UCL	70.84
Anderson-Darling Test Statistic	2.099	95% Bootstrap-t UCL	70.2
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	69.14
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	70.32
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	68.57
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	89.28
		97.5% Chebyshev(Mean, Sd) UCL	101.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	125.9
95% Approximate Gamma UCL	80.61		
95% Adjusted Gamma UCL	84.25		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	89.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	10	Maximum of Log Data	2.303
Mean	9.045	Mean of log Data	1.813
Median	10	SD of log Data	1.646
SD	2.87		
Coefficient of Variation	0.317		
Skewness	-3.337		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.391	Shapiro Wilk Test Statistic	0.34
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.53	95% H-UCL	190.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	62.87
95% Adjusted-CLT UCL (Chen-1995)	9.555	97.5% Chebyshev (MVUE) UCL	81.75
95% Modified-t UCL (Johnson-1978)	10.4	99% Chebyshev (MVUE) UCL	118.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.127	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.028		
MLE of Mean	9.045		
MLE of Standard Deviation	8.521		
nu star	27.04		
Approximate Chi Square Value (.05)	16.18	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.41
Adjusted Chi Square Value	14.91	95% Jackknife UCL	10.53
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.126	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.66
		97.5% Chebyshev(Mean, Sd) UCL	14.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.29
95% Approximate Gamma UCL	15.11		
95% Adjusted Gamma UCL	16.4		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.29
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.027	Minimum of Log Data	-3.612
Maximum	0.216	Maximum of Log Data	-1.534
Mean	0.121	Mean of log Data	-2.187
Median	0.121	SD of log Data	0.478
SD	0.0402		
Coefficient of Variation	0.331		
Skewness	-3.82E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.514
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.142	95% H-UCL	0.171
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.201
95% Adjusted-CLT UCL (Chen-1995)	0.14	97.5% Chebyshev (MVUE) UCL	0.234
95% Modified-t UCL (Johnson-1978)	0.142	99% Chebyshev (MVUE) UCL	0.299

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.031	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0241		
MLE of Mean	0.121		
MLE of Standard Deviation	0.0541		
nu star	120.7		
Approximate Chi Square Value (.05)	96.36	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.14
Adjusted Chi Square Value	93.04	95% Jackknife UCL	0.142
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.86	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.172
		97.5% Chebyshev(Mean, Sd) UCL	0.194
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.237
95% Approximate Gamma UCL	0.152		
95% Adjusted Gamma UCL	0.157		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.142
	or 95% Modified-t UCL	0.142

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	31.6	Minimum of Log Data	3.453
Maximum	40.4	Maximum of Log Data	3.699
Mean	36	Mean of log Data	3.582
Median	36	SD of log Data	0.0525
SD	1.876		
Coefficient of Variation	0.0521		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.598
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	36.97	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.38
95% Adjusted-CLT UCL (Chen-1995)	36.89	97.5% Chebyshev (MVUE) UCL	39.41
95% Modified-t UCL (Johnson-1978)	36.97	99% Chebyshev (MVUE) UCL	41.43

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	299.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.12		
MLE of Mean	36		
MLE of Standard Deviation	2.081		
nu star	7180		
Approximate Chi Square Value (.05)	6984	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	36.89
Adjusted Chi Square Value	6954	95% Jackknife UCL	36.97
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.716	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.423	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38.36
		97.5% Chebyshev(Mean, Sd) UCL	39.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.39
95% Approximate Gamma UCL	37.01		
95% Adjusted Gamma UCL	37.17		

Potential UCL to Use		
	Use 95% Student's-t UCL	36.97
	or 95% Modified-t UCL	36.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-10.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	2.8	Minimum of Log Data	1.03
Maximum	11	Maximum of Log Data	2.398
Mean	8.996	Mean of log Data	2.136
Median	9.725	SD of log Data	0.41
SD	2.622		
Coefficient of Variation	0.291		
Skewness	-1.51		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.791	Shapiro Wilk Test Statistic	0.697
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.35	95% H-UCL	11.84
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.93
95% Adjusted-CLT UCL (Chen-1995)	9.888	97.5% Chebyshev (MVUE) UCL	16
95% Modified-t UCL (Johnson-1978)	10.3	99% Chebyshev (MVUE) UCL	20.07

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.367	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.413		
MLE of Mean	8.996		
MLE of Standard Deviation	3.565		
nu star	152.8		
Approximate Chi Square Value (.05)	125.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.24
Adjusted Chi Square Value	121.4	95% Jackknife UCL	10.35
		95% Standard Bootstrap UCL	10.22
Anderson-Darling Test Statistic	1.304	95% Bootstrap-t UCL	10.07
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	9.942
Kolmogorov-Smirnov Test Statistic	0.272	95% Percentile Bootstrap UCL	10.1
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	9.934
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.29
		97.5% Chebyshev(Mean, Sd) UCL	13.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.53
95% Approximate Gamma UCL	10.98		
95% Adjusted Gamma UCL	11.32		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.35
	or 95% Modified-t UCL	10.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	11.5	Minimum of Log Data	2.442
Maximum	54.96	Maximum of Log Data	4.007
Mean	37.44	Mean of log Data	3.569
Median	37.94	SD of log Data	0.387
SD	10.44		
Coefficient of Variation	0.279		
Skewness	-1.075		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.722
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	42.85	95% H-UCL	48.37
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	56.78
95% Adjusted-CLT UCL (Chen-1995)	41.39	97.5% Chebyshev (MVUE) UCL	64.91
95% Modified-t UCL (Johnson-1978)	42.69	99% Chebyshev (MVUE) UCL	80.88

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.148	Data appear Normal at 5% Significance Level	
Theta Star	5.237		
MLE of Mean	37.44		
MLE of Standard Deviation	14		
nu star	171.6		
Approximate Chi Square Value (.05)	142.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	42.39
Adjusted Chi Square Value	138.2	95% Jackknife UCL	42.85
		95% Standard Bootstrap UCL	42.28
Anderson-Darling Test Statistic	0.99	95% Bootstrap-t UCL	41.83
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	41.92
Kolmogorov-Smirnov Test Statistic	0.261	95% Percentile Bootstrap UCL	41.68
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	41.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	50.57
		97.5% Chebyshev(Mean, Sd) UCL	56.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	67.42
95% Approximate Gamma UCL	45.14		
95% Adjusted Gamma UCL	46.47		

Potential UCL to Use		Use 95% Student's-t UCL	42.85

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	83.64	Minimum of Log Data	4.427
Maximum	892.3	Maximum of Log Data	6.794
Mean	265.7	Mean of log Data	5.414
Median	198.3	SD of log Data	0.554
SD	206.8		
Coefficient of Variation	0.778		
Skewness	2.917		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.612	Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	372.9	95% H-UCL	378.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	443
95% Adjusted-CLT UCL (Chen-1995)	417.6	97.5% Chebyshev (MVUE) UCL	523
95% Modified-t UCL (Johnson-1978)	381.3	99% Chebyshev (MVUE) UCL	680.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.402	Data appear Lognormal at 5% Significance Level	
Theta Star	110.6		
MLE of Mean	265.7		
MLE of Standard Deviation	171.5		
nu star	57.65		
Approximate Chi Square Value (.05)	41.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	363.9
Adjusted Chi Square Value	39.08	95% Jackknife UCL	372.9
		95% Standard Bootstrap UCL	361.3
Anderson-Darling Test Statistic	1.018	95% Bootstrap-t UCL	540.5
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	770.4
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	378.9
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	435.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	525.9
		97.5% Chebyshev(Mean, Sd) UCL	638.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	859.6
95% Approximate Gamma UCL	371.9		
95% Adjusted Gamma UCL	392		

Potential UCL to Use		Use 95% H-UCL	378.5

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	9.2	Minimum of Log Data	2.219
Maximum	79.83	Maximum of Log Data	4.38
Mean	62.34	Mean of log Data	4.039
Median	65	SD of log Data	0.577
SD	17.4		
Coefficient of Variation	0.279		
Skewness	-2.96		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.521	Shapiro Wilk Test Statistic	0.41
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.36	95% H-UCL	99.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	115.5
95% Adjusted-CLT UCL (Chen-1995)	66.01	97.5% Chebyshev (MVUE) UCL	136.8
95% Modified-t UCL (Johnson-1978)	70.64	99% Chebyshev (MVUE) UCL	178.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.202	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.83		
MLE of Mean	62.34		
MLE of Standard Deviation	30.41		
nu star	100.9		
Approximate Chi Square Value (.05)	78.68	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	70.6
Adjusted Chi Square Value	75.7	95% Jackknife UCL	71.36
		95% Standard Bootstrap UCL	70.37
Anderson-Darling Test Statistic	3.252	95% Bootstrap-t UCL	68.79
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	67.29
Kolmogorov-Smirnov Test Statistic	0.512	95% Percentile Bootstrap UCL	68.76
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	68.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	84.23
		97.5% Chebyshev(Mean, Sd) UCL	93.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	112.3
95% Approximate Gamma UCL	79.9		
95% Adjusted Gamma UCL	83.05		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	84.23

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.051	Minimum of Log Data	-2.976
Maximum	13.11	Maximum of Log Data	2.573
Mean	8.844	Mean of log Data	1.468
Median	10	SD of log Data	2.074
SD	4.265		
Coefficient of Variation	0.482		
Skewness	-1.69		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.653	Shapiro Wilk Test Statistic	0.502
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.06	95% H-UCL	918
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	94.85
95% Adjusted-CLT UCL (Chen-1995)	10.23	97.5% Chebyshev (MVUE) UCL	125.1
95% Modified-t UCL (Johnson-1978)	10.96	99% Chebyshev (MVUE) UCL	184.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.678	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.04		
MLE of Mean	8.844		
MLE of Standard Deviation	10.74		
nu star	16.28		
Approximate Chi Square Value (.05)	8.158	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.87
Adjusted Chi Square Value	7.297	95% Jackknife UCL	11.06
		95% Standard Bootstrap UCL	10.78
Anderson-Darling Test Statistic	3.217	95% Bootstrap-t UCL	10.71
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	10.24
Kolmogorov-Smirnov Test Statistic	0.518	95% Percentile Bootstrap UCL	10.73
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	10.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.21
		97.5% Chebyshev(Mean, Sd) UCL	16.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.1
95% Approximate Gamma UCL	17.65		
95% Adjusted Gamma UCL	19.73		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	21.1
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-11.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	5550	Minimum of Log Data	8.622
Maximum	28100	Maximum of Log Data	10.24
Mean	16825	Mean of log Data	9.681
Median	16825	SD of log Data	0.365
SD	4808		
Coefficient of Variation	0.286		
Skewness	0		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.539
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19317	95% H-UCL	21295
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24923
95% Adjusted-CLT UCL (Chen-1995)	19108	97.5% Chebyshev (MVUE) UCL	28346
95% Modified-t UCL (Johnson-1978)	19317	99% Chebyshev (MVUE) UCL	35070

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.727	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2178		
MLE of Mean	16825		
MLE of Standard Deviation	6053		
nu star	185.4		
Approximate Chi Square Value (.05)	154.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	19108
Adjusted Chi Square Value	150.7	95% Jackknife UCL	19317
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.807	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.458	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22875
		97.5% Chebyshev(Mean, Sd) UCL	25492
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30634
95% Approximate Gamma UCL	20137		
95% Adjusted Gamma UCL	20705		

Potential UCL to Use		
	Use 95% Student's-t UCL	19317
	or 95% Modified-t UCL	19317

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	7.54	Minimum of Log Data	2.02
Maximum	24.6	Maximum of Log Data	3.203
Mean	10.53	Mean of log Data	2.294
Median	9.31	SD of log Data	0.327
SD	4.67		
Coefficient of Variation	0.444		
Skewness	2.871		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.601	Shapiro Wilk Test Statistic	0.742
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.95	95% H-UCL	12.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.75
95% Adjusted-CLT UCL (Chen-1995)	13.94	97.5% Chebyshev (MVUE) UCL	16.62
95% Modified-t UCL (Johnson-1978)	13.13	99% Chebyshev (MVUE) UCL	20.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.469	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.627		
MLE of Mean	10.53		
MLE of Standard Deviation	4.138		
nu star	155.3		
Approximate Chi Square Value (.05)	127.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.74
Adjusted Chi Square Value	123.6	95% Jackknife UCL	12.95
		95% Standard Bootstrap UCL	12.65
Anderson-Darling Test Statistic	1.312	95% Bootstrap-t UCL	16.45
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	21.01
Kolmogorov-Smirnov Test Statistic	0.32	95% Percentile Bootstrap UCL	12.96
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	13.96
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.4
		97.5% Chebyshev(Mean, Sd) UCL	18.94
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.94
95% Approximate Gamma UCL	12.82		
95% Adjusted Gamma UCL	13.22		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.95
	or 95% Modified-t UCL	13.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
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and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	105	Minimum of Log Data	4.654
Maximum	453	Maximum of Log Data	6.116
Mean	279	Mean of log Data	5.59
Median	279	SD of log Data	0.326
SD	74.19		
Coefficient of Variation	0.266		
Skewness	0		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.548
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	317.5	95% H-UCL	342.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	397.7
95% Adjusted-CLT UCL (Chen-1995)	314.2	97.5% Chebyshev (MVUE) UCL	448.1
95% Modified-t UCL (Johnson-1978)	317.5	99% Chebyshev (MVUE) UCL	547.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.315	Data do not follow a Discernable Distribution (0.05)	
Theta Star	29.95		
MLE of Mean	279		
MLE of Standard Deviation	91.42		
nu star	223.5		
Approximate Chi Square Value (.05)	189.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	314.2
Adjusted Chi Square Value	185.2	95% Jackknife UCL	317.5
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.791	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	372.4
		97.5% Chebyshev(Mean, Sd) UCL	412.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	492.1
95% Approximate Gamma UCL	328.4		
95% Adjusted Gamma UCL	336.7		

Potential UCL to Use		
	Use 95% Student's-t UCL	317.5
	or 95% Modified-t UCL	317.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
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and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.038	Minimum of Log Data	-3.27
Maximum	0.325	Maximum of Log Data	-1.124
Mean	0.182	Mean of log Data	-1.788
Median	0.182	SD of log Data	0.496
SD	0.0612		
Coefficient of Variation	0.337		
Skewness	8.26E-16		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.511
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.213	95% H-UCL	0.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.306
95% Adjusted-CLT UCL (Chen-1995)	0.211	97.5% Chebyshev (MVUE) UCL	0.358
95% Modified-t UCL (Johnson-1978)	0.213	99% Chebyshev (MVUE) UCL	0.46

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.764	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0381		
MLE of Mean	0.182		
MLE of Standard Deviation	0.0832		
nu star	114.3		
Approximate Chi Square Value (.05)	90.64	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.211
Adjusted Chi Square Value	87.43	95% Jackknife UCL	0.213
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.868	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.47	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.258
		97.5% Chebyshev(Mean, Sd) UCL	0.292
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.357
95% Approximate Gamma UCL	0.229		
95% Adjusted Gamma UCL	0.237		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.213
	or 95% Modified-t UCL	0.213

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	37.08	Minimum of Log Data	3.613
Maximum	85	Maximum of Log Data	4.443
Mean	49.56	Mean of log Data	3.875
Median	46.19	SD of log Data	0.238
SD	13.6		
Coefficient of Variation	0.274		
Skewness	1.882		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.801	Shapiro Wilk Test Statistic	0.882
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	56.61	95% H-UCL	56.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64.35
95% Adjusted-CLT UCL (Chen-1995)	58.29	97.5% Chebyshev (MVUE) UCL	70.81
95% Modified-t UCL (Johnson-1978)	56.96	99% Chebyshev (MVUE) UCL	83.49

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.33	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.717		
MLE of Mean	49.56		
MLE of Standard Deviation	13.57		
nu star	320		
Approximate Chi Square Value (.05)	279.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	56.01
Adjusted Chi Square Value	273.8	95% Jackknife UCL	56.61
		95% Standard Bootstrap UCL	55.61
Anderson-Darling Test Statistic	0.655	95% Bootstrap-t UCL	63.9
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	89.89
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	56.33
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	59.19
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.67
		97.5% Chebyshev(Mean, Sd) UCL	74.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	88.62
95% Approximate Gamma UCL	56.73		
95% Adjusted Gamma UCL	57.92		

Potential UCL to Use	Use 95% Approximate Gamma UCL	56.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	4.5	Minimum of Log Data	1.504
Maximum	27.7	Maximum of Log Data	3.321
Mean	16.1	Mean of log Data	2.718
Median	16.1	SD of log Data	0.413
SD	4.946		
Coefficient of Variation	0.307		
Skewness	1.44E-15		

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.528
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18.66	95% H-UCL	21.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	25.02
95% Adjusted-CLT UCL (Chen-1995)	18.45	97.5% Chebyshev (MVUE) UCL	28.76
95% Modified-t UCL (Johnson-1978)	18.66	99% Chebyshev (MVUE) UCL	36.11

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.324	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.546		
MLE of Mean	16.1		
MLE of Standard Deviation	6.402		
nu star	151.8		
Approximate Chi Square Value (.05)	124.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	18.45
Adjusted Chi Square Value	120.5	95% Jackknife UCL	18.66
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.829	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.463	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.32
		97.5% Chebyshev(Mean, Sd) UCL	25.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.31
95% Approximate Gamma UCL	19.66		
95% Adjusted Gamma UCL	20.28		

Potential UCL to Use		
	Use 95% Student's-t UCL	18.66
	or 95% Modified-t UCL	18.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	10188	Minimum of Log Data	9.229
Maximum	46000	Maximum of Log Data	10.74
Mean	15918	Mean of log Data	9.573
Median	11735	SD of log Data	0.414
SD	9846		
Coefficient of Variation	0.619		
Skewness	3.028		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.56	Shapiro Wilk Test Statistic	0.725
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	21023	95% H-UCL	20213
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23785
95% Adjusted-CLT UCL (Chen-1995)	23248	97.5% Chebyshev (MVUE) UCL	27352
95% Modified-t UCL (Johnson-1978)	21437	99% Chebyshev (MVUE) UCL	34357

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.847	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4138		
MLE of Mean	15918		
MLE of Standard Deviation	8116		
nu star	92.32		
Approximate Chi Square Value (.05)	71.16	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	20593
Adjusted Chi Square Value	68.33	95% Jackknife UCL	21023
		95% Standard Bootstrap UCL	20390
Anderson-Darling Test Statistic	1.524	95% Bootstrap-t UCL	30762
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	37192
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	20977
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	24232
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28308
		97.5% Chebyshev(Mean, Sd) UCL	33669
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	44199
95% Approximate Gamma UCL	20651		
95% Adjusted Gamma UCL	21506		

Potential UCL to Use		
	Use 95% Student's-t UCL	21023
	or 95% Modified-t UCL	21437

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	114.4	Minimum of Log Data	4.739
Maximum	1270	Maximum of Log Data	7.147
Mean	364.4	Mean of log Data	5.7
Median	287.5	SD of log Data	0.604
SD	303.8		
Coefficient of Variation	8.34E-01		
Skewness	2.775		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.653	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	521.9	95% H-UCL	542.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	629.3
95% Adjusted-CLT UCL (Chen-1995)	583.7	97.5% Chebyshev (MVUE) UCL	749
95% Modified-t UCL (Johnson-1978)	533.6	99% Chebyshev (MVUE) UCL	984.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.063	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	176.6		
MLE of Mean	364.4		
MLE of Standard Deviation	253.7		
nu star	49.51		
Approximate Chi Square Value (.05)	34.36	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	508.6
Adjusted Chi Square Value	32.44	95% Jackknife UCL	521.9
		95% Standard Bootstrap UCL	499.4
Anderson-Darling Test Statistic	0.713	95% Bootstrap-t UCL	783.8
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	1169
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	522.5
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	603.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	746.6
		97.5% Chebyshev(Mean, Sd) UCL	912
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1237
95% Approximate Gamma UCL	525.1		
95% Adjusted Gamma UCL	556.2		

Potential UCL to Use	Use 95% Approximate Gamma UCL	525.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	6.9	Minimum of Log Data	1.932
Maximum	83.79	Maximum of Log Data	4.428
Mean	59.55	Mean of log Data	3.966
Median	65	SD of log Data	0.663
SD	19.2		
Coefficient of Variation	0.322		
Skewness	-2.144		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.636	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.5	95% H-UCL	105.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.1
95% Adjusted-CLT UCL (Chen-1995)	65	97.5% Chebyshev (MVUE) UCL	144.2
95% Modified-t UCL (Johnson-1978)	68.93	99% Chebyshev (MVUE) UCL	191.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.276	Data do not follow a Discernable Distribution (0.05)	
Theta Star	18.18		
MLE of Mean	59.55		
MLE of Standard Deviation	32.9		
nu star	78.62		
Approximate Chi Square Value (.05)	59.19	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	68.66
Adjusted Chi Square Value	56.63	95% Jackknife UCL	69.5
		95% Standard Bootstrap UCL	68.2
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	66.75
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	66.14
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	66.57
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65.35
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.7
		97.5% Chebyshev(Mean, Sd) UCL	94.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	114.7
95% Approximate Gamma UCL	79.09		
95% Adjusted Gamma UCL	82.68		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	83.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.051	Minimum of Log Data	-2.976
Maximum	10	Maximum of Log Data	2.303
Mean	8.213	Mean of log Data	1.536
Median	10	SD of log Data	1.778
SD	3.801		
Coefficient of Variation	0.463		
Skewness	-1.984		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.521	Shapiro Wilk Test Statistic	0.501
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.18	95% H-UCL	249
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	59.82
95% Adjusted-CLT UCL (Chen-1995)	9.346	97.5% Chebyshev (MVUE) UCL	78.19
95% Modified-t UCL (Johnson-1978)	10.08	99% Chebyshev (MVUE) UCL	114.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.814	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.08		
MLE of Mean	8.213		
MLE of Standard Deviation	9.1		
nu star	19.55		
Approximate Chi Square Value (.05)	10.52	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.02
Adjusted Chi Square Value	9.521	95% Jackknife UCL	10.18
		95% Standard Bootstrap UCL	9.909
Anderson-Darling Test Statistic	3.329	95% Bootstrap-t UCL	9.664
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	9.454
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	9.71
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	9.187
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13
		97.5% Chebyshev(Mean, Sd) UCL	15.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.13
95% Approximate Gamma UCL	15.26		
95% Adjusted Gamma UCL	16.86		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) UCL	19.13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	0.66	Maximum of Log Data	-0.416
Mean	0.385	Mean of log Data	-1.014
Median	0.385	SD of log Data	0.406
SD	0.117		
Coefficient of Variation	0.305		
Skewness	1.64E-15		

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There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.529
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.446	95% H-UCL	0.505
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.594
95% Adjusted-CLT UCL (Chen-1995)	0.441	97.5% Chebyshev (MVUE) UCL	0.682
95% Modified-t UCL (Johnson-1978)	0.446	99% Chebyshev (MVUE) UCL	0.855

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.483	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0594		
MLE of Mean	0.385		
MLE of Standard Deviation	0.151		
nu star	155.6		
Approximate Chi Square Value (.05)	127.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.441
Adjusted Chi Square Value	123.9	95% Jackknife UCL	0.446
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.826	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.533
		97.5% Chebyshev(Mean, Sd) UCL	0.596
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.722
95% Approximate Gamma UCL	0.469		
95% Adjusted Gamma UCL	0.483		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.446
	or 95% Modified-t UCL	0.446

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0085	Minimum of Log Data	-4.768
Maximum	0.0409	Maximum of Log Data	-3.197
Mean	0.0247	Mean of log Data	-3.748
Median	0.0247	SD of log Data	0.352
SD	0.00691		
Coefficient of Variation	0.28		
Skewness	0		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.542
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0283	95% H-UCL	0.0309
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0361
95% Adjusted-CLT UCL (Chen-1995)	0.028	97.5% Chebyshev (MVUE) UCL	0.041
95% Modified-t UCL (Johnson-1978)	0.0283	99% Chebyshev (MVUE) UCL	0.0505

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.18	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00302		
MLE of Mean	0.0247		
MLE of Standard Deviation	0.00864		
nu star	196.3		
Approximate Chi Square Value (.05)	164.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.028
Adjusted Chi Square Value	160.5	95% Jackknife UCL	0.0283
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.802	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0334
		97.5% Chebyshev(Mean, Sd) UCL	0.0372
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0445
95% Approximate Gamma UCL	0.0294		
95% Adjusted Gamma UCL	0.0302		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0283
	or 95% Modified-t UCL	0.0283

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	17.5	Minimum of Log Data	2.862
Maximum	79.7	Maximum of Log Data	4.378
Mean	48.6	Mean of log Data	3.84
Median	48.6	SD of log Data	0.339
SD	13.26		
Coefficient of Variation	0.273		
Skewness	0		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.545
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	55.47	95% H-UCL	60.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	70.18
95% Adjusted-CLT UCL (Chen-1995)	54.9	97.5% Chebyshev (MVUE) UCL	79.33
95% Modified-t UCL (Johnson-1978)	55.47	99% Chebyshev (MVUE) UCL	97.32

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.721	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.573		
MLE of Mean	48.6		
MLE of Standard Deviation	16.46		
nu star	209.3		
Approximate Chi Square Value (.05)	176.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	54.9
Adjusted Chi Square Value	172.3	95% Jackknife UCL	55.47
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.796	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.456	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	65.29
		97.5% Chebyshev(Mean, Sd) UCL	72.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	86.69
95% Approximate Gamma UCL	57.53		
95% Adjusted Gamma UCL	59.05		

Potential UCL to Use		
	Use 95% Student's-t UCL	55.47
	or 95% Modified-t UCL	55.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-12.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	6.2	Minimum of Log Data	1.825
Maximum	11.5	Maximum of Log Data	2.442
Mean	9.99	Mean of log Data	2.287
Median	11	SD of log Data	0.187
SD	1.663		
Coefficient of Variation	0.166		
Skewness	-1.219		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.737	Shapiro Wilk Test Statistic	0.725
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.75	95% H-UCL	10.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.12
95% Adjusted-CLT UCL (Chen-1995)	10.55	97.5% Chebyshev (MVUE) UCL	13.03
95% Modified-t UCL (Johnson-1978)	10.72	99% Chebyshev (MVUE) UCL	14.83

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.374		
MLE of Mean	9.99		
MLE of Standard Deviation	1.933		
nu star	801		
Approximate Chi Square Value (.05)	736.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.7
Adjusted Chi Square Value	728.7	95% Jackknife UCL	10.75
		95% Standard Bootstrap UCL	10.68
Anderson-Darling Test Statistic	2.023	95% Bootstrap-t UCL	10.62
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	10.57
Kolmogorov-Smirnov Test Statistic	0.4	95% Percentile Bootstrap UCL	10.61
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	10.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.86
		97.5% Chebyshev(Mean, Sd) UCL	12.67
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.26
95% Approximate Gamma UCL	10.87		
95% Adjusted Gamma UCL	10.98		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.75
	or 95% Modified-t UCL	10.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.51	Minimum of Log Data	-0.673
Maximum	0.75	Maximum of Log Data	-0.288
Mean	0.6	Mean of log Data	-0.514
Median	0.6	SD of log Data	0.0789
SD	0.0494		
Coefficient of Variation	0.0824		
Skewness	1.659		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.602	Shapiro Wilk Test Statistic	0.625
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.622	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.653
95% Adjusted-CLT UCL (Chen-1995)	0.627	97.5% Chebyshev (MVUE) UCL	0.676
95% Modified-t UCL (Johnson-1978)	0.623	99% Chebyshev (MVUE) UCL	0.722

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	134.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00447		
MLE of Mean	0.6		
MLE of Standard Deviation	0.0518		
nu star	4029		
Approximate Chi Square Value (.05)	3882	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.621
Adjusted Chi Square Value	3865	95% Jackknife UCL	0.622
		95% Standard Bootstrap UCL	0.621
Anderson-Darling Test Statistic	3.005	95% Bootstrap-t UCL	0.624
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	0.746
Kolmogorov-Smirnov Test Statistic	0.423	95% Percentile Bootstrap UCL	0.62
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	0.624
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.656
		97.5% Chebyshev(Mean, Sd) UCL	0.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.727
95% Approximate Gamma UCL	0.623		
95% Adjusted Gamma UCL	0.625		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.622
	or 95% Modified-t UCL	0.623

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	12.9	Minimum of Log Data	2.557
Maximum	85	Maximum of Log Data	4.443
Mean	55.49	Mean of log Data	3.937
Median	49.29	SD of log Data	0.458
SD	19.76		
Coefficient of Variation	0.356		
Skewness	-0.00288		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.775
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.48	95% H-UCL	72.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.43
95% Adjusted-CLT UCL (Chen-1995)	63.88	97.5% Chebyshev (MVUE) UCL	99.36
95% Modified-t UCL (Johnson-1978)	64.48	99% Chebyshev (MVUE) UCL	124.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.251	Data appear Normal at 5% Significance Level	
Theta Star	10.57		
MLE of Mean	55.49		
MLE of Standard Deviation	24.22		
nu star	157.5		
Approximate Chi Square Value (.05)	129.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	63.89
Adjusted Chi Square Value	126.4	95% Jackknife UCL	64.48
		95% Standard Bootstrap UCL	63.64
Anderson-Darling Test Statistic	0.902	95% Bootstrap-t UCL	64.77
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	65.04
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	63.72
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	63.41
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.74
		97.5% Chebyshev(Mean, Sd) UCL	87.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	106.3
95% Approximate Gamma UCL	67.5		
95% Adjusted Gamma UCL	69.17		

Potential UCL to Use		Use 95% Student's-t UCL	64.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	110.5	Minimum of Log Data	4.705
Maximum	978.6	Maximum of Log Data	6.886
Mean	350.6	Mean of log Data	5.668
Median	254.8	SD of log Data	0.609
SD	258.3		
Coefficient of Variation	0.737		
Skewness	1.85		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.741	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	468	95% H-UCL	497.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	588.9
95% Adjusted-CLT UCL (Chen-1995)	494.3	97.5% Chebyshev (MVUE) UCL	695.1
95% Modified-t UCL (Johnson-1978)	473.4	99% Chebyshev (MVUE) UCL	903.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.255	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	155.5		
MLE of Mean	350.6		
MLE of Standard Deviation	233.5		
nu star	67.64		
Approximate Chi Square Value (.05)	49.71	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	460.3
Adjusted Chi Square Value	47.82	95% Jackknife UCL	468
		95% Standard Bootstrap UCL	457.1
Anderson-Darling Test Statistic	0.728	95% Bootstrap-t UCL	621.4
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	1138
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	464.5
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	485.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	641.3
		97.5% Chebyshev(Mean, Sd) UCL	767.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1014
95% Approximate Gamma UCL	477		
95% Adjusted Gamma UCL	495.9		

Potential UCL to Use		Use 95% Approximate Gamma UCL	477

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	9.7	Minimum of Log Data	2.272
Maximum	99.76	Maximum of Log Data	4.603
Mean	60.43	Mean of log Data	3.891
Median	65	SD of log Data	0.813
SD	27.95		
Coefficient of Variation	0.463		
Skewness	-1.029		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.14	95% H-UCL	116.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	131.1
95% Adjusted-CLT UCL (Chen-1995)	70.25	97.5% Chebyshev (MVUE) UCL	159.1
95% Modified-t UCL (Johnson-1978)	72.82	99% Chebyshev (MVUE) UCL	214.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.071	Data do not follow a Discernable Distribution (0.05)	
Theta Star	29.18		
MLE of Mean	60.43		
MLE of Standard Deviation	41.99		
nu star	62.12		
Approximate Chi Square Value (.05)	44.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	72.3
Adjusted Chi Square Value	43.2	95% Jackknife UCL	73.14
		95% Standard Bootstrap UCL	72.11
Anderson-Darling Test Statistic	2.22	95% Bootstrap-t UCL	70.98
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	70.38
Kolmogorov-Smirnov Test Statistic	0.387	95% Percentile Bootstrap UCL	70.9
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	70.32
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.89
		97.5% Chebyshev(Mean, Sd) UCL	105.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	132.2
95% Approximate Gamma UCL	83.43		
95% Adjusted Gamma UCL	86.89		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	91.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	25.6	Minimum of Log Data	3.243
Maximum	42.4	Maximum of Log Data	3.747
Mean	35.3	Mean of log Data	3.559
Median	35.3	SD of log Data	0.101
SD	3.287		
Coefficient of Variation	0.0931		
Skewness	-1.247		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.567
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	36.79	95% H-UCL	37.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.31
95% Adjusted-CLT UCL (Chen-1995)	36.4	97.5% Chebyshev (MVUE) UCL	41.04
95% Modified-t UCL (Johnson-1978)	36.75	99% Chebyshev (MVUE) UCL	44.44

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	89.79	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.393		
MLE of Mean	35.3		
MLE of Standard Deviation	3.725		
nu star	2694		
Approximate Chi Square Value (.05)	2574	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	36.7
Adjusted Chi Square Value	2560	95% Jackknife UCL	36.79
		95% Standard Bootstrap UCL	36.71
Anderson-Darling Test Statistic	3.21	95% Bootstrap-t UCL	36.55
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	36.56
Kolmogorov-Smirnov Test Statistic	0.446	95% Percentile Bootstrap UCL	36.59
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	36.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39
		97.5% Chebyshev(Mean, Sd) UCL	40.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.74
95% Approximate Gamma UCL	36.94		
95% Adjusted Gamma UCL	37.15		

Potential UCL to Use		
	Use 95% Student's-t UCL	36.79
	or 95% Modified-t UCL	36.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-13.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	4.8	Minimum of Log Data	1.569
Maximum	11	Maximum of Log Data	2.398
Mean	8.875	Mean of log Data	2.152
Median	8.84	SD of log Data	0.272
SD	2.138		
Coefficient of Variation	0.241		
Skewness	-0.647		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.931	95% H-UCL	10.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.85
95% Adjusted-CLT UCL (Chen-1995)	9.736	97.5% Chebyshev (MVUE) UCL	13.13
95% Modified-t UCL (Johnson-1978)	9.914	99% Chebyshev (MVUE) UCL	15.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.43	Data appear Normal at 5% Significance Level	
Theta Star	0.714		
MLE of Mean	8.875		
MLE of Standard Deviation	2.517		
nu star	323.2		
Approximate Chi Square Value (.05)	282.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.85
Adjusted Chi Square Value	277.1	95% Jackknife UCL	9.931
		95% Standard Bootstrap UCL	9.8
Anderson-Darling Test Statistic	0.716	95% Bootstrap-t UCL	9.832
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	9.732
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	9.795
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	9.73
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.46
		97.5% Chebyshev(Mean, Sd) UCL	12.58
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.77
95% Approximate Gamma UCL	10.15		
95% Adjusted Gamma UCL	10.35		

Potential UCL to Use		
	Use 95% Student's-t UCL	9.931

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	8.6	Minimum of Log Data	2.152
Maximum	65.51	Maximum of Log Data	4.182
Mean	45.09	Mean of log Data	3.724
Median	46.86	SD of log Data	0.511
SD	14.49		
Coefficient of Variation	0.321		
Skewness	-1.107		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.682
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	52.25	95% H-UCL	64.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	76.31
95% Adjusted-CLT UCL (Chen-1995)	50.38	97.5% Chebyshev (MVUE) UCL	89.13
95% Modified-t UCL (Johnson-1978)	52.05	99% Chebyshev (MVUE) UCL	114.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.708	Data appear Normal at 5% Significance Level	
Theta Star	9.577		
MLE of Mean	45.09		
MLE of Standard Deviation	20.78		
nu star	122.4		
Approximate Chi Square Value (.05)	97.87	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	51.7
Adjusted Chi Square Value	94.74	95% Jackknife UCL	52.25
		95% Standard Bootstrap UCL	51.41
Anderson-Darling Test Statistic	1.055	95% Bootstrap-t UCL	51.3
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	50.83
Kolmogorov-Smirnov Test Statistic	0.226	95% Percentile Bootstrap UCL	51.37
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	50.31
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	62.61
		97.5% Chebyshev(Mean, Sd) UCL	70.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	85.07
95% Approximate Gamma UCL	56.4		
95% Adjusted Gamma UCL	58.26		

Potential UCL to Use		Use 95% Student's-t UCL	52.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	11.3	Minimum of Log Data	2.425
Maximum	86.4	Maximum of Log Data	4.459
Mean	63.17	Mean of log Data	4.071
Median	65	SD of log Data	0.502
SD	16.76		
Coefficient of Variation	0.265		
Skewness	-2.633		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.551	Shapiro Wilk Test Statistic	0.424
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.45	95% H-UCL	90.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.7
95% Adjusted-CLT UCL (Chen-1995)	67.19	97.5% Chebyshev (MVUE) UCL	124.4
95% Modified-t UCL (Johnson-1978)	70.89	99% Chebyshev (MVUE) UCL	159.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.327	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.86		
MLE of Mean	63.17		
MLE of Standard Deviation	27.37		
nu star	138.5		
Approximate Chi Square Value (.05)	112.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	70.82
Adjusted Chi Square Value	109	95% Jackknife UCL	71.45
		95% Standard Bootstrap UCL	70.6
Anderson-Darling Test Statistic	3.363	95% Bootstrap-t UCL	69.1
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	68.27
Kolmogorov-Smirnov Test Statistic	0.503	95% Percentile Bootstrap UCL	69.6
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	68.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.43
		97.5% Chebyshev(Mean, Sd) UCL	92.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.4
95% Approximate Gamma UCL	77.9		
95% Adjusted Gamma UCL	80.3		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	83.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.052	Minimum of Log Data	-2.957
Maximum	10	Maximum of Log Data	2.303
Mean	9.027	Mean of log Data	1.876
Median	10	SD of log Data	1.453
SD	2.743		
Coefficient of Variation	0.304		
Skewness	-3.405		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.414	Shapiro Wilk Test Statistic	0.333
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.38	95% H-UCL	88.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.1
95% Adjusted-CLT UCL (Chen-1995)	9.511	97.5% Chebyshev (MVUE) UCL	61.86
95% Modified-t UCL (Johnson-1978)	10.26	99% Chebyshev (MVUE) UCL	88.88

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.35	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.687		
MLE of Mean	9.027		
MLE of Standard Deviation	7.769		
nu star	35.1		
Approximate Chi Square Value (.05)	22.54	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.28
Adjusted Chi Square Value	21.12	95% Jackknife UCL	10.38
		95% Standard Bootstrap UCL	10.22
Anderson-Darling Test Statistic	4.299	95% Bootstrap-t UCL	9.93
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	9.767
Kolmogorov-Smirnov Test Statistic	0.501	95% Percentile Bootstrap UCL	9.892
Kolmogorov-Smirnov 5% Critical Value	0.24	95% BCA Bootstrap UCL	9.802
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.34
		97.5% Chebyshev(Mean, Sd) UCL	13.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.6
95% Approximate Gamma UCL	14.05		
95% Adjusted Gamma UCL	15		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.34

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-14.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	6.38	Minimum of Log Data	1.853
Maximum	11	Maximum of Log Data	2.398
Mean	9.275	Mean of log Data	2.211
Median	9.22	SD of log Data	0.193
SD	1.712		
Coefficient of Variation	0.185		
Skewness	-0.298		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.12	95% H-UCL	10.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.45
95% Adjusted-CLT UCL (Chen-1995)	10.01	97.5% Chebyshev (MVUE) UCL	12.39
95% Modified-t UCL (Johnson-1978)	10.11	99% Chebyshev (MVUE) UCL	14.24

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	23.27	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	0.399		
MLE of Mean	9.275		
MLE of Standard Deviation	1.923		
nu star	605		
Approximate Chi Square Value (.05)	549	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.06
Adjusted Chi Square Value	541.4	95% Jackknife UCL	10.12
		95% Standard Bootstrap UCL	10.03
Anderson-Darling Test Statistic	0.774	95% Bootstrap-t UCL	10.08
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	9.977
Kolmogorov-Smirnov Test Statistic	0.232	95% Percentile Bootstrap UCL	10.02
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	9.985
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.34
		97.5% Chebyshev(Mean, Sd) UCL	12.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14
95% Approximate Gamma UCL	10.22		
95% Adjusted Gamma UCL	10.37		

Potential UCL to Use		
	Use 95% Approximate Gamma UCL	10.22

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	18.2	Minimum of Log Data	2.901
Maximum	85	Maximum of Log Data	4.443
Mean	53.53	Mean of log Data	3.901
Median	52.74	SD of log Data	0.432
SD	20.99		
Coefficient of Variation	0.392		
Skewness	0.361		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.921
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.9	95% H-UCL	70.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	82.6
95% Adjusted-CLT UCL (Chen-1995)	63.73	97.5% Chebyshev (MVUE) UCL	95.02
95% Modified-t UCL (Johnson-1978)	64	99% Chebyshev (MVUE) UCL	119.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.048	Data appear Normal at 5% Significance Level	
Theta Star	10.6		
MLE of Mean	53.53		
MLE of Standard Deviation	23.82		
nu star	131.3		
Approximate Chi Square Value (.05)	105.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	63.1
Adjusted Chi Square Value	102.5	95% Jackknife UCL	63.9
		95% Standard Bootstrap UCL	62.57
Anderson-Darling Test Statistic	0.36	95% Bootstrap-t UCL	65.02
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	63.9
Kolmogorov-Smirnov Test Statistic	0.15	95% Percentile Bootstrap UCL	62.66
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	63.04
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.9
		97.5% Chebyshev(Mean, Sd) UCL	89.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	111.4
95% Approximate Gamma UCL	66.41		
95% Adjusted Gamma UCL	68.52		

Potential UCL to Use		Use 95% Student's-t UCL	63.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0174	Minimum of Log Data	-4.051
Maximum	10	Maximum of Log Data	2.303
Mean	8.195	Mean of log Data	1.34
Median	10	SD of log Data	2.261
SD	3.753		
Coefficient of Variation	0.458		
Skewness	-1.933		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk Test Statistic	0.478
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.05	95% H-UCL	1644
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	120.1
95% Adjusted-CLT UCL (Chen-1995)	9.311	97.5% Chebyshev (MVUE) UCL	159
95% Modified-t UCL (Johnson-1978)	9.957	99% Chebyshev (MVUE) UCL	235.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.651	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.59		
MLE of Mean	8.195		
MLE of Standard Deviation	10.16		
nu star	16.92		
Approximate Chi Square Value (.05)	8.618	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	9.907
Adjusted Chi Square Value	7.787	95% Jackknife UCL	10.05
		95% Standard Bootstrap UCL	9.794
Anderson-Darling Test Statistic	3.786	95% Bootstrap-t UCL	9.704
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	9.457
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	9.46
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	9.232
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.73
		97.5% Chebyshev(Mean, Sd) UCL	14.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.55
95% Approximate Gamma UCL	16.09		
95% Adjusted Gamma UCL	17.81		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.55

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	7	Minimum of Log Data	1.946
Maximum	82.18	Maximum of Log Data	4.409
Mean	62.5	Mean of log Data	4.028
Median	65	SD of log Data	0.633
SD	17.95		
Coefficient of Variation	0.287		
Skewness	-2.706		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.644	Shapiro Wilk Test Statistic	0.446
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.38	95% H-UCL	104.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	121
95% Adjusted-CLT UCL (Chen-1995)	66.7	97.5% Chebyshev (MVUE) UCL	144.2
95% Modified-t UCL (Johnson-1978)	70.75	99% Chebyshev (MVUE) UCL	189.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.777	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.55		
MLE of Mean	62.5		
MLE of Standard Deviation	32.16		
nu star	98.2		
Approximate Chi Square Value (.05)	76.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	70.69
Adjusted Chi Square Value	73.6	95% Jackknife UCL	71.38
		95% Standard Bootstrap UCL	70.5
Anderson-Darling Test Statistic	2.87	95% Bootstrap-t UCL	69.01
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	68
Kolmogorov-Smirnov Test Statistic	0.418	95% Percentile Bootstrap UCL	69.3
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	68.11
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	84.2
		97.5% Chebyshev(Mean, Sd) UCL	93.59
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	112
95% Approximate Gamma UCL	80.4		
95% Adjusted Gamma UCL	83.4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	84.2
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.049	Minimum of Log Data	-3.016
Maximum	10	Maximum of Log Data	2.303
Mean	8.383	Mean of log Data	1.483
Median	10	SD of log Data	1.975
SD	3.71		
Coefficient of Variation	0.443		
Skewness	-2.148		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.481	Shapiro Wilk Test Statistic	0.455
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.22	95% H-UCL	463
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.15
95% Adjusted-CLT UCL (Chen-1995)	9.42	97.5% Chebyshev (MVUE) UCL	106.6
95% Modified-t UCL (Johnson-1978)	10.11	99% Chebyshev (MVUE) UCL	156.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.749	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.19		
MLE of Mean	8.383		
MLE of Standard Deviation	9.684		
nu star	19.48		
Approximate Chi Square Value (.05)	10.47	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.08
Adjusted Chi Square Value	9.542	95% Jackknife UCL	10.22
		95% Standard Bootstrap UCL	9.989
Anderson-Darling Test Statistic	4.008	95% Bootstrap-t UCL	9.666
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	9.493
Kolmogorov-Smirnov Test Statistic	0.504	95% Percentile Bootstrap UCL	9.826
Kolmogorov-Smirnov 5% Critical Value	0.244	95% BCA Bootstrap UCL	9.235
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.87
		97.5% Chebyshev(Mean, Sd) UCL	14.81
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.62
95% Approximate Gamma UCL	15.6		
95% Adjusted Gamma UCL	17.12		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.62
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-15.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	4.4	Minimum of Log Data	1.482
Maximum	11	Maximum of Log Data	2.398
Mean	9.524	Mean of log Data	2.214
Median	11	SD of log Data	0.319
SD	2.384		
Coefficient of Variation	0.25		
Skewness	-1.493		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.676	Shapiro Wilk Test Statistic	0.644
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.65	95% H-UCL	11.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.2
95% Adjusted-CLT UCL (Chen-1995)	10.3	97.5% Chebyshev (MVUE) UCL	14.76
95% Modified-t UCL (Johnson-1978)	10.61	99% Chebyshev (MVUE) UCL	17.82

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.967	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.956		
MLE of Mean	9.524		
MLE of Standard Deviation	3.017		
nu star	279.1		
Approximate Chi Square Value (.05)	241.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	10.57
Adjusted Chi Square Value	236.7	95% Jackknife UCL	10.65
		95% Standard Bootstrap UCL	10.51
Anderson-Darling Test Statistic	2.216	95% Bootstrap-t UCL	10.46
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	10.32
Kolmogorov-Smirnov Test Statistic	0.374	95% Percentile Bootstrap UCL	10.5
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	10.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.3
		97.5% Chebyshev(Mean, Sd) UCL	13.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.87
95% Approximate Gamma UCL	11.01		
95% Adjusted Gamma UCL	11.23		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.65
	or 95% Modified-t UCL	10.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	0	Log Statistics Not Avaliable
Maximum	0.358	
Mean	0.179	
Median	0.179	
SD	0.0702	
Coefficient of Variation	0.392	
Skewness	0	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.551	Not Available
Shapiro Wilk Critical Value	0.874	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.212	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.212	95% Adjusted-CLT UCL (Chen 1995)		0.21
		95% Modified-t UCL (Johnson-1978)		0.212

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.261	95% CLT UCL		0.21
		95% Jackknife UCL		0.212
		95% Standard Bootstrap UCL	N/A	
		95% Bootstrap-t UCL	N/A	
		95% Hall's Bootstrap UCL	N/A	
		95% Percentile Bootstrap UCL	N/A	
		95% BCA Bootstrap UCL	N/A	
		95% Chebyshev(Mean, Sd) UCL		0.261
		97.5% Chebyshev(Mean, Sd) UCL		0.296
		99% Chebyshev(Mean, Sd) UCL		0.366

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	8	Minimum of Log Data	2.079
Maximum	85	Maximum of Log Data	4.443
Mean	46.8	Mean of log Data	3.707
Median	42.89	SD of log Data	0.601
SD	23.33		
Coefficient of Variation	0.499		
Skewness	0.65		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.878	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.84	95% H-UCL	70.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	83.12
95% Adjusted-CLT UCL (Chen-1995)	58.21	97.5% Chebyshev (MVUE) UCL	98.27
95% Modified-t UCL (Johnson-1978)	58.02	99% Chebyshev (MVUE) UCL	128

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.004	Data appear Normal at 5% Significance Level	
Theta Star	15.58		
MLE of Mean	46.8		
MLE of Standard Deviation	27		
nu star	84.1		
Approximate Chi Square Value (.05)	63.96	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	57.05
Adjusted Chi Square Value	61.64	95% Jackknife UCL	57.84
		95% Standard Bootstrap UCL	56.72
Anderson-Darling Test Statistic	0.566	95% Bootstrap-t UCL	58.89
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	58.22
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	56.59
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	58.75
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.98
		97.5% Chebyshev(Mean, Sd) UCL	85.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	108.8
95% Approximate Gamma UCL	61.53		
95% Adjusted Gamma UCL	63.85		

Potential UCL to Use		Use 95% Student's-t UCL	57.84

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-16.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Cesium-137

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.029	Minimum of Log Data	-3.54
Maximum	0.44	Maximum of Log Data	-0.821
Mean	0.21	Mean of log Data	-1.653
Median	0.21	SD of log Data	0.541
SD	0.077		
Coefficient of Variation	0.364		
Skewness	1.025		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.569	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.244	95% H-UCL	0.297
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.354
95% Adjusted-CLT UCL (Chen-1995)	0.247	97.5% Chebyshev (MVUE) UCL	0.412
95% Modified-t UCL (Johnson-1978)	0.245	99% Chebyshev (MVUE) UCL	0.526

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.493	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.047		
MLE of Mean	0.21		
MLE of Standard Deviation	0.099		
nu star	143.8		
Approximate Chi Square Value (.05)	117.1	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	0.242
Adjusted Chi Square Value	114.3	95% Jackknife UCL	0.244
		95% Standard Bootstrap UCL	0.241
Anderson-Darling Test Statistic	3.714	95% Bootstrap-t UCL	0.246
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	0.283
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	0.242
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	0.239
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.294
		97.5% Chebyshev(Mean, Sd) UCL	0.33
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.401
95% Approximate Gamma UCL	0.258		
95% Adjusted Gamma UCL	0.265		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.294

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	30.77	Minimum of Log Data	3.427
Maximum	85	Maximum of Log Data	4.443
Mean	65.06	Mean of log Data	4.102
Median	85	SD of log Data	0.412
SD	23.71		
Coefficient of Variation	0.364		
Skewness	-0.37		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.708	Shapiro Wilk Test Statistic	0.732
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	75.45	95% H-UCL	81.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	95.39
95% Adjusted-CLT UCL (Chen-1995)	74.22	97.5% Chebyshev (MVUE) UCL	108.4
95% Modified-t UCL (Johnson-1978)	75.36	99% Chebyshev (MVUE) UCL	133.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.695	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.42		
MLE of Mean	65.06		
MLE of Standard Deviation	27.26		
nu star	182.2		
Approximate Chi Square Value (.05)	152	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	74.81
Adjusted Chi Square Value	148.9	95% Jackknife UCL	75.45
		95% Standard Bootstrap UCL	74.53
Anderson-Darling Test Statistic	2.202	95% Bootstrap-t UCL	74.71
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	73.32
Kolmogorov-Smirnov Test Statistic	0.368	95% Percentile Bootstrap UCL	73.95
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	74.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	90.9
		97.5% Chebyshev(Mean, Sd) UCL	102.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124
95% Approximate Gamma UCL	78		
95% Adjusted Gamma UCL	79.64		

Potential UCL to Use		
	Use 95% Student's-t UCL	75.45
	or 95% Modified-t UCL	75.36

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	147.3	Minimum of Log Data	4.993
Maximum	875	Maximum of Log Data	6.774
Mean	307.8	Mean of log Data	5.614
Median	240.3	SD of log Data	0.463
SD	182		
Coefficient of Variation	0.591		
Skewness	2.288		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.742	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	387.6	95% H-UCL	388
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	459.7
95% Adjusted-CLT UCL (Chen-1995)	410.5	97.5% Chebyshev (MVUE) UCL	527.6
95% Modified-t UCL (Johnson-1978)	391.9	99% Chebyshev (MVUE) UCL	660.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.679	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	83.67		
MLE of Mean	307.8		
MLE of Standard Deviation	160.5		
nu star	117.7		
Approximate Chi Square Value (.05)	93.67	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	382.7
Adjusted Chi Square Value	91.23	95% Jackknife UCL	387.6
		95% Standard Bootstrap UCL	380.6
Anderson-Darling Test Statistic	0.771	95% Bootstrap-t UCL	457.9
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	665.2
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	385.8
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	420.2
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	506.2
		97.5% Chebyshev(Mean, Sd) UCL	592
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	760.6
95% Approximate Gamma UCL	386.9		
95% Adjusted Gamma UCL	397.2		

Potential UCL to Use		Use 95% Approximate Gamma UCL	386.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.036	Minimum of Log Data	-3.321
Maximum	10	Maximum of Log Data	2.303
Mean	9.092	Mean of log Data	1.918
Median	10	SD of log Data	1.401
SD	2.55		
Coefficient of Variation	0.28		
Skewness	-3.41		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.423	Shapiro Wilk Test Statistic	0.307
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.21	95% H-UCL	61.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	44.89
95% Adjusted-CLT UCL (Chen-1995)	9.559	97.5% Chebyshev (MVUE) UCL	57.25
95% Modified-t UCL (Johnson-1978)	10.12	99% Chebyshev (MVUE) UCL	81.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.568	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.799		
MLE of Mean	9.092		
MLE of Standard Deviation	7.261		
nu star	50.17		
Approximate Chi Square Value (.05)	34.9	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	10.14
Adjusted Chi Square Value	33.46	95% Jackknife UCL	10.21
		95% Standard Bootstrap UCL	10.1
Anderson-Darling Test Statistic	5.159	95% Bootstrap-t UCL	9.837
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	9.722
Kolmogorov-Smirnov Test Statistic	0.459	95% Percentile Bootstrap UCL	9.813
Kolmogorov-Smirnov 5% Critical Value	0.218	95% BCA Bootstrap UCL	9.714
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.87
		97.5% Chebyshev(Mean, Sd) UCL	13.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.43
95% Approximate Gamma UCL	13.07		
95% Adjusted Gamma UCL	13.63		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.87
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	16	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	4.2	Minimum of Log Data	1.435
Maximum	85.86	Maximum of Log Data	4.453
Mean	61.36	Mean of log Data	3.918
Median	65	SD of log Data	0.868
SD	23.24		
Coefficient of Variation	0.379		
Skewness	-1.84		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.727	Shapiro Wilk Test Statistic	0.538
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.54	95% H-UCL	128.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	143.9
95% Adjusted-CLT UCL (Chen-1995)	68.06	97.5% Chebyshev (MVUE) UCL	175.4
95% Modified-t UCL (Johnson-1978)	71.1	99% Chebyshev (MVUE) UCL	237.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.214	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.71		
MLE of Mean	61.36		
MLE of Standard Deviation	41.24		
nu star	70.84		
Approximate Chi Square Value (.05)	52.47	Nonparametric Statistics	
Adjusted Level of Significance	0.034	95% CLT UCL	70.91
Adjusted Chi Square Value	50.67	95% Jackknife UCL	71.54
		95% Standard Bootstrap UCL	70.62
Anderson-Darling Test Statistic	3.104	95% Bootstrap-t UCL	69.42
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	68.46
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	69.69
Kolmogorov-Smirnov 5% Critical Value	0.217	95% BCA Bootstrap UCL	68.64
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.68
		97.5% Chebyshev(Mean, Sd) UCL	97.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	119.2
95% Approximate Gamma UCL	82.85		
95% Adjusted Gamma UCL	85.79		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	86.68
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-17.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	4	Minimum of Log Data	1.386
Maximum	11	Maximum of Log Data	2.398
Mean	9.477	Mean of log Data	2.21
Median	11	SD of log Data	0.305
SD	2.346		
Coefficient of Variation	0.248		
Skewness	-1.197		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.683
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.32	95% H-UCL	10.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.21
95% Adjusted-CLT UCL (Chen-1995)	10.15	97.5% Chebyshev (MVUE) UCL	13.37
95% Modified-t UCL (Johnson-1978)	10.3	99% Chebyshev (MVUE) UCL	15.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.827		
MLE of Mean	9.477		
MLE of Standard Deviation	2.8		
nu star	527.1		
Approximate Chi Square Value (.05)	474.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.28
Adjusted Chi Square Value	471.3	95% Jackknife UCL	10.32
		95% Standard Bootstrap UCL	10.24
Anderson-Darling Test Statistic	3.39	95% Bootstrap-t UCL	10.21
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	10.14
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	10.25
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	10.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.61
		97.5% Chebyshev(Mean, Sd) UCL	12.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.34
95% Approximate Gamma UCL	10.52		
95% Adjusted Gamma UCL	10.6		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.32
	or 95% Modified-t UCL	10.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	10.3	Minimum of Log Data	2.332
Maximum	120.8	Maximum of Log Data	4.794
Mean	57.07	Mean of log Data	3.942
Median	49.89	SD of log Data	0.497
SD	25.21		
Coefficient of Variation	0.442		
Skewness	0.866		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.902	Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.09	95% H-UCL	71.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.11
95% Adjusted-CLT UCL (Chen-1995)	66.73	97.5% Chebyshev (MVUE) UCL	96.87
95% Modified-t UCL (Johnson-1978)	66.25	99% Chebyshev (MVUE) UCL	120

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.414	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	12.93		
MLE of Mean	57.07		
MLE of Standard Deviation	27.16		
nu star	203		
Approximate Chi Square Value (.05)	171.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	65.71
Adjusted Chi Square Value	168.9	95% Jackknife UCL	66.09
		95% Standard Bootstrap UCL	65.46
Anderson-Darling Test Statistic	0.824	95% Bootstrap-t UCL	67.83
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	67.44
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	66.03
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	66.16
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.98
		97.5% Chebyshev(Mean, Sd) UCL	89.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	109.4
95% Approximate Gamma UCL	67.73		
95% Adjusted Gamma UCL	68.58		

Potential UCL to Use		Use 95% Approximate Gamma UCL	67.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	23

Raw Statistics		Log-transformed Statistics	
Minimum	170.6	Minimum of Log Data	5.139
Maximum	1418	Maximum of Log Data	7.257
Mean	401.5	Mean of log Data	5.821
Median	307.5	SD of log Data	0.572
SD	283.5		
Coefficient of Variation	0.706		
Skewness	2.284		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.756	Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	503	95% H-UCL	509
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	608.9
95% Adjusted-CLT UCL (Chen-1995)	528.8	97.5% Chebyshev (MVUE) UCL	701.9
95% Modified-t UCL (Johnson-1978)	507.7	99% Chebyshev (MVUE) UCL	884.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.661	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	150.9		
MLE of Mean	401.5		
MLE of Standard Deviation	246.1		
nu star	122.4		
Approximate Chi Square Value (.05)	97.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	498.7
Adjusted Chi Square Value	96.26	95% Jackknife UCL	503
		95% Standard Bootstrap UCL	493.8
Anderson-Darling Test Statistic	0.764	95% Bootstrap-t UCL	555.5
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	671.7
Kolmogorov-Smirnov Test Statistic	0.155	95% Percentile Bootstrap UCL	502.4
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	530.8
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	659.1
		97.5% Chebyshev(Mean, Sd) UCL	770.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	989.7
95% Approximate Gamma UCL	502.2		
95% Adjusted Gamma UCL	510.5		

Potential UCL to Use	Use 95% Approximate Gamma UCL	502.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0205	Minimum of Log Data	-3.887
Maximum	10	Maximum of Log Data	2.303
Mean	8.596	Mean of log Data	1.631
Median	10	SD of log Data	1.801
SD	3.392		
Coefficient of Variation	0.395		
Skewness	-2.241		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.452	Shapiro Wilk Test Statistic	0.423
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.81	95% H-UCL	108
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	67.53
95% Adjusted-CLT UCL (Chen-1995)	9.406	97.5% Chebyshev (MVUE) UCL	87.19
95% Modified-t UCL (Johnson-1978)	9.755	99% Chebyshev (MVUE) UCL	125.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.983	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.745		
MLE of Mean	8.596		
MLE of Standard Deviation	8.67		
nu star	45.22		
Approximate Chi Square Value (.05)	30.79	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	9.759
Adjusted Chi Square Value	29.93	95% Jackknife UCL	9.81
		95% Standard Bootstrap UCL	9.713
Anderson-Darling Test Statistic	7.006	95% Bootstrap-t UCL	9.508
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	9.438
Kolmogorov-Smirnov Test Statistic	0.511	95% Percentile Bootstrap UCL	9.567
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	9.447
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.68
		97.5% Chebyshev(Mean, Sd) UCL	13.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.63
95% Approximate Gamma UCL	12.62		
95% Adjusted Gamma UCL	12.99		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.68
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	5.2	Minimum of Log Data	1.649
Maximum	70.86	Maximum of Log Data	4.261
Mean	58.79	Mean of log Data	3.958
Median	65	SD of log Data	0.652
SD	16.79		
Coefficient of Variation	0.286		
Skewness	-2.873		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.485	Shapiro Wilk Test Statistic	0.399
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.8	95% H-UCL	86.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.5
95% Adjusted-CLT UCL (Chen-1995)	62.31	97.5% Chebyshev (MVUE) UCL	121.9
95% Modified-t UCL (Johnson-1978)	64.45	99% Chebyshev (MVUE) UCL	156.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.918	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.01		
MLE of Mean	58.79		
MLE of Standard Deviation	29.7		
nu star	180.2		
Approximate Chi Square Value (.05)	150.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	64.55
Adjusted Chi Square Value	148.2	95% Jackknife UCL	64.8
		95% Standard Bootstrap UCL	64.35
Anderson-Darling Test Statistic	6.223	95% Bootstrap-t UCL	62.92
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	62.93
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	64.08
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	63
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.05
		97.5% Chebyshev(Mean, Sd) UCL	80.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	93.62
95% Approximate Gamma UCL	70.56		
95% Adjusted Gamma UCL	71.5		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	74.05
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.35	Minimum of Log Data	-1.05
Maximum	5	Maximum of Log Data	1.609
Mean	4.412	Mean of log Data	1.299
Median	5	SD of log Data	0.83
SD	1.554		
Coefficient of Variation	0.352		
Skewness	-2.359		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.406	Shapiro Wilk Test Statistic	0.414
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.968	95% H-UCL	7.784
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.265
95% Adjusted-CLT UCL (Chen-1995)	4.774	97.5% Chebyshev (MVUE) UCL	11.08
95% Modified-t UCL (Johnson-1978)	4.942	99% Chebyshev (MVUE) UCL	14.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.507	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.759		
MLE of Mean	4.412		
MLE of Standard Deviation	2.786		
nu star	115.3		
Approximate Chi Square Value (.05)	91.55	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	4.945
Adjusted Chi Square Value	90.01	95% Jackknife UCL	4.968
		95% Standard Bootstrap UCL	4.905
Anderson-Darling Test Statistic	7.098	95% Bootstrap-t UCL	4.863
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	4.82
Kolmogorov-Smirnov Test Statistic	0.53	95% Percentile Bootstrap UCL	4.799
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	4.799
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.825
		97.5% Chebyshev(Mean, Sd) UCL	6.436
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.637
95% Approximate Gamma UCL	5.558		
95% Adjusted Gamma UCL	5.653		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.825

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.033	Minimum of Log Data	-3.411
Maximum	12.38	Maximum of Log Data	2.516
Mean	8.835	Mean of log Data	1.727
Median	10	SD of log Data	1.614
SD	3.444		
Coefficient of Variation	0.39		
Skewness	-2.243		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.478	Shapiro Wilk Test Statistic	0.429
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.07	95% H-UCL	67.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.89
95% Adjusted-CLT UCL (Chen-1995)	9.658	97.5% Chebyshev (MVUE) UCL	66.36
95% Modified-t UCL (Johnson-1978)	10.01	99% Chebyshev (MVUE) UCL	94.79
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.114	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.934		
MLE of Mean	8.835		
MLE of Standard Deviation	8.373		
nu star	51.22		
Approximate Chi Square Value (.05)	35.79	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.02
Adjusted Chi Square Value	34.85	95% Jackknife UCL	10.07
		95% Standard Bootstrap UCL	9.971
Anderson-Darling Test Statistic	6.947	95% Bootstrap-t UCL	9.839
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	9.719
Kolmogorov-Smirnov Test Statistic	0.54	95% Percentile Bootstrap UCL	9.798
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	9.775
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.97
		97.5% Chebyshev(Mean, Sd) UCL	13.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.98
95% Approximate Gamma UCL	12.65		
95% Adjusted Gamma UCL	12.99		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	0.69	Maximum of Log Data	-0.371
Mean	0.45	Mean of log Data	-0.829
Median	0.45	SD of log Data	0.297
SD	0.0891		
Coefficient of Variation	0.198		
Skewness	-1.506		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.472	Shapiro Wilk Test Statistic	0.374
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.482	95% H-UCL	0.512
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.58
95% Adjusted-CLT UCL (Chen-1995)	0.474	97.5% Chebyshev (MVUE) UCL	0.634
95% Modified-t UCL (Johnson-1978)	0.481	99% Chebyshev (MVUE) UCL	0.74

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.22	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0317		
MLE of Mean	0.45		
MLE of Standard Deviation	0.119		
nu star	654		
Approximate Chi Square Value (.05)	595.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.481
Adjusted Chi Square Value	591.7	95% Jackknife UCL	0.482
		95% Standard Bootstrap UCL	0.48
Anderson-Darling Test Statistic	6.271	95% Bootstrap-t UCL	0.477
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.478
Kolmogorov-Smirnov Test Statistic	0.489	95% Percentile Bootstrap UCL	0.479
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	0.472
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.531
		97.5% Chebyshev(Mean, Sd) UCL	0.566
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.635
95% Approximate Gamma UCL	0.494		
95% Adjusted Gamma UCL	0.497		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.482
	or 95% Modified-t UCL	0.481

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0117	Minimum of Log Data	-4.448
Maximum	0.316	Maximum of Log Data	-1.152
Mean	0.164	Mean of log Data	-1.895
Median	0.164	SD of log Data	0.573
SD	0.0459		
Coefficient of Variation	0.28		
Skewness	-4.03E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.31
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.18	95% H-UCL	0.227
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.272
95% Adjusted-CLT UCL (Chen-1995)	0.18	97.5% Chebyshev (MVUE) UCL	0.313
95% Modified-t UCL (Johnson-1978)	0.18	99% Chebyshev (MVUE) UCL	0.395

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	5.214	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0314			
MLE of Mean	0.164			
MLE of Standard Deviation	0.0717			
nu star	239.9			
Approximate Chi Square Value (.05)	205	Nonparametric Statistics		
Adjusted Level of Significance	0.0389	95% CLT UCL		0.18
Adjusted Chi Square Value	202.7	95% Jackknife UCL		0.18
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	7.094	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.511	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		0.205
		97.5% Chebyshev(Mean, Sd) UCL		0.224
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		0.259
95% Approximate Gamma UCL	0.192			
95% Adjusted Gamma UCL	0.194			

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.205

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.054	Minimum of Log Data	-2.919
Maximum	0.132	Maximum of Log Data	-2.025
Mean	0.093	Mean of log Data	-2.384
Median	0.093	SD of log Data	0.138
SD	0.0118		
Coefficient of Variation	0.126		
Skewness	4.77E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.396
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0972	95% H-UCL	0.098
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.105
95% Adjusted-CLT UCL (Chen-1995)	0.097	97.5% Chebyshev (MVUE) UCL	0.11
95% Modified-t UCL (Johnson-1978)	0.0972	99% Chebyshev (MVUE) UCL	0.12

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	51.88	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00179		
MLE of Mean	0.093		
MLE of Standard Deviation	0.0129		
nu star	2386		
Approximate Chi Square Value (.05)	2274	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.097
Adjusted Chi Square Value	2266	95% Jackknife UCL	0.0972
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	6.831	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.474	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.104
		97.5% Chebyshev(Mean, Sd) UCL	0.108
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.117
95% Approximate Gamma UCL	0.0976		
95% Adjusted Gamma UCL	0.0979		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.0972
	or 95% Modified-t UCL	0.0972

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.85	Minimum of Log Data	-0.163
Maximum	2.48	Maximum of Log Data	0.908
Mean	1.665	Mean of log Data	0.498
Median	1.665	SD of log Data	0.166
SD	0.246		
Coefficient of Variation	0.148		
Skewness	8.20E-15		

Warning: There are only 3 Distinct Values in this data
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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.389
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.753	95% H-UCL	1.775
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.92
95% Adjusted-CLT UCL (Chen-1995)	1.749	97.5% Chebyshev (MVUE) UCL	2.03
95% Modified-t UCL (Johnson-1978)	1.753	99% Chebyshev (MVUE) UCL	2.245

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	36.68	Data do not follow a Discernable Distribution (0.05)		
Theta Star	0.0454			
MLE of Mean	1.665			
MLE of Standard Deviation	0.275			
nu star	1687			
Approximate Chi Square Value (.05)	1593	Nonparametric Statistics		
Adjusted Level of Significance	0.0389	95% CLT UCL		1.749
Adjusted Chi Square Value	1586	95% Jackknife UCL		1.753
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	6.842	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.477	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		1.888
		97.5% Chebyshev(Mean, Sd) UCL		1.985
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		2.175
95% Approximate Gamma UCL	1.764			
95% Adjusted Gamma UCL	1.771			

Potential UCL to Use		
	Use 95% Student's-t UCL	1.753
	or 95% Modified-t UCL	1.753

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	35.84	Minimum of Log Data	3.579
Maximum	85	Maximum of Log Data	4.443
Mean	74.6	Mean of log Data	4.277
Median	85	SD of log Data	0.299
SD	17.97		
Coefficient of Variation	0.241		
Skewness	-1.522		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.66	Shapiro Wilk Test Statistic	0.647
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	85.01	95% H-UCL	91.73
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.1
95% Adjusted-CLT UCL (Chen-1995)	81.02	97.5% Chebyshev (MVUE) UCL	119.6
95% Modified-t UCL (Johnson-1978)	84.56	99% Chebyshev (MVUE) UCL	146

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.26	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.273		
MLE of Mean	74.6		
MLE of Standard Deviation	23.29		
nu star	205.1		
Approximate Chi Square Value (.05)	173	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	83.94
Adjusted Chi Square Value	167.9	95% Jackknife UCL	85.01
		95% Standard Bootstrap UCL	83.01
Anderson-Darling Test Statistic	1.741	95% Bootstrap-t UCL	83.01
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	81.51
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	81.69
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	80.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	99.36
		97.5% Chebyshev(Mean, Sd) UCL	110.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	131.1
95% Approximate Gamma UCL	88.46		
95% Adjusted Gamma UCL	91.16		

Potential UCL to Use		
	Use 95% Student's-t UCL	85.01
	or 95% Modified-t UCL	84.56

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	11.2	Minimum of Log Data	2.416
Maximum	70.2	Maximum of Log Data	4.251
Mean	58.9	Mean of log Data	3.985
Median	65	SD of log Data	0.556
SD	17.33		
Coefficient of Variation	0.294		
Skewness	-2.823		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.532	Shapiro Wilk Test Statistic	0.453
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	68.95	95% H-UCL	96.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.1
95% Adjusted-CLT UCL (Chen-1995)	62.69	97.5% Chebyshev (MVUE) UCL	131
95% Modified-t UCL (Johnson-1978)	68.13	99% Chebyshev (MVUE) UCL	172.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.036	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.6		
MLE of Mean	58.9		
MLE of Standard Deviation	29.32		
nu star	80.72		
Approximate Chi Square Value (.05)	61.01	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	67.92
Adjusted Chi Square Value	58.05	95% Jackknife UCL	68.95
		95% Standard Bootstrap UCL	67.42
Anderson-Darling Test Statistic	2.585	95% Bootstrap-t UCL	65.66
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	64.29
Kolmogorov-Smirnov Test Statistic	0.447	95% Percentile Bootstrap UCL	65.84
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	64.28
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.79
		97.5% Chebyshev(Mean, Sd) UCL	93.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	113.4
95% Approximate Gamma UCL	77.92		
95% Adjusted Gamma UCL	81.91		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	82.79
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	10	Maximum of Log Data	2.303
Mean	8.94	Mean of log Data	1.728
Median	10	SD of log Data	1.795
SD	3.136		
Coefficient of Variation	0.351		
Skewness	-3.139		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.397	Shapiro Wilk Test Statistic	0.372
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.76	95% H-UCL	530.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	74.03
95% Adjusted-CLT UCL (Chen-1995)	9.52	97.5% Chebyshev (MVUE) UCL	97.12
95% Modified-t UCL (Johnson-1978)	10.59	99% Chebyshev (MVUE) UCL	142.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.921	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.712		
MLE of Mean	8.94		
MLE of Standard Deviation	9.318		
nu star	18.41		
Approximate Chi Square Value (.05)	9.689	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	10.57
Adjusted Chi Square Value	8.61	95% Jackknife UCL	10.76
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.457	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.539	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.273	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.26
		97.5% Chebyshev(Mean, Sd) UCL	15.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.81
95% Approximate Gamma UCL	16.99		
95% Adjusted Gamma UCL	19.12		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.81
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	34.78	Minimum of Log Data	3.549
Maximum	85	Maximum of Log Data	4.443
Mean	61.63	Mean of log Data	4.058
Median	45.2	SD of log Data	0.376
SD	22.57		
Coefficient of Variation	0.366		
Skewness	0.15		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.73	Shapiro Wilk Test Statistic	0.764
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.96	95% H-UCL	78.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	92.49
95% Adjusted-CLT UCL (Chen-1995)	73.15	97.5% Chebyshev (MVUE) UCL	105.8
95% Modified-t UCL (Johnson-1978)	74.02	99% Chebyshev (MVUE) UCL	132

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.916	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.42		
MLE of Mean	61.63		
MLE of Standard Deviation	25.34		
nu star	130.2		
Approximate Chi Square Value (.05)	104.8	Nonparametric Statistics	
Adjusted Level of Significance	0.028	95% CLT UCL	72.82
Adjusted Chi Square Value	101.1	95% Jackknife UCL	73.96
		95% Standard Bootstrap UCL	72.13
Anderson-Darling Test Statistic	1.421	95% Bootstrap-t UCL	75.02
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	70.29
Kolmogorov-Smirnov Test Statistic	0.314	95% Percentile Bootstrap UCL	72.69
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	73.04
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.29
		97.5% Chebyshev(Mean, Sd) UCL	104.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	129.3
95% Approximate Gamma UCL	76.54		
95% Adjusted Gamma UCL	79.35		

Potential UCL to Use		
	Use 95% Student's-t UCL	73.96
	or 95% Modified-t UCL	74.02

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.054	Minimum of Log Data	-2.919
Maximum	10	Maximum of Log Data	2.303
Mean	9.049	Mean of log Data	1.823
Median	10	SD of log Data	1.573
SD	2.987		
Coefficient of Variation	0.33		
Skewness	-3.3		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.37	Shapiro Wilk Test Statistic	0.35
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.68	95% H-UCL	171.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	56.3
95% Adjusted-CLT UCL (Chen-1995)	9.572	97.5% Chebyshev (MVUE) UCL	73.1
95% Modified-t UCL (Johnson-1978)	10.53	99% Chebyshev (MVUE) UCL	106.1

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.124	Data do not follow a Discernable Distribution (0.05)		
Theta Star	8.053			
MLE of Mean	9.049			
MLE of Standard Deviation	8.536			
nu star	24.72			
Approximate Chi Square Value (.05)	14.4	Nonparametric Statistics		
Adjusted Level of Significance	0.028	95% CLT UCL		10.53
Adjusted Chi Square Value	13.13	95% Jackknife UCL		10.68
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.841	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.54	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.26	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12.97
		97.5% Chebyshev(Mean, Sd) UCL		14.67
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		18.01
95% Approximate Gamma UCL	15.54			
95% Adjusted Gamma UCL	17.04			

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	18.01

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	12.5	Minimum of Log Data	2.526
Maximum	85	Maximum of Log Data	4.443
Mean	58.09	Mean of log Data	3.921
Median	50.3	SD of log Data	0.615
SD	27.52		
Coefficient of Variation	0.474		
Skewness	-0.238		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.828
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.13	95% H-UCL	95.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	109.5
95% Adjusted-CLT UCL (Chen-1995)	71.1	97.5% Chebyshev (MVUE) UCL	131
95% Modified-t UCL (Johnson-1978)	73.03	99% Chebyshev (MVUE) UCL	173.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.755	Data do not follow a Discernable Distribution (0.05)	
Theta Star	21.09		
MLE of Mean	58.09		
MLE of Standard Deviation	35		
nu star	60.6		
Approximate Chi Square Value (.05)	43.7	Nonparametric Statistics	
Adjusted Level of Significance	0.028	95% CLT UCL	71.74
Adjusted Chi Square Value	41.37	95% Jackknife UCL	73.13
		95% Standard Bootstrap UCL	71.01
Anderson-Darling Test Statistic	0.759	95% Bootstrap-t UCL	72.87
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	70.4
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	71.08
Kolmogorov-Smirnov 5% Critical Value	0.257	95% BCA Bootstrap UCL	70.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.25
		97.5% Chebyshev(Mean, Sd) UCL	109.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	140.6
95% Approximate Gamma UCL	80.56		
95% Adjusted Gamma UCL	85.1		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	94.25

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	12.8	Minimum of Log Data	2.549
Maximum	65	Maximum of Log Data	4.174
Mean	59.09	Mean of log Data	4.007
Median	65	SD of log Data	0.488
SD	15.83		
Coefficient of Variation	0.268		
Skewness	-3.009		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.406
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.74	95% H-UCL	86.39
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	101.2
95% Adjusted-CLT UCL (Chen-1995)	62.31	97.5% Chebyshev (MVUE) UCL	118.5
95% Modified-t UCL (Johnson-1978)	67.01	99% Chebyshev (MVUE) UCL	152.5

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	5.204	Data do not follow a Discernable Distribution (0.05)		
Theta Star	11.35			
MLE of Mean	59.09			
MLE of Standard Deviation	25.9			
nu star	114.5			
Approximate Chi Square Value (.05)	90.79	Nonparametric Statistics		
Adjusted Level of Significance	0.028	95% CLT UCL		66.94
Adjusted Chi Square Value	87.35	95% Jackknife UCL		67.74
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.125	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		79.89
		97.5% Chebyshev(Mean, Sd) UCL		88.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		106.6
95% Approximate Gamma UCL	74.51			
95% Adjusted Gamma UCL	77.44			

Potential UCL to Use		
	Use 95% Student's-t UCL	67.74
	or 95% Modified-t UCL	67.01

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)

and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	9
Raw Statistics		Log-transformed Statistics	
Minimum	31.26	Minimum of Log Data	3.442
Maximum	85	Maximum of Log Data	4.443
Mean	61.57	Mean of log Data	4.057
Median	61.57	SD of log Data	0.376
SD	21.57		
Coefficient of Variation	0.35		
Skewness	-0.0252		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.38	95% H-UCL	75.48
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88.37
95% Adjusted-CLT UCL (Chen-1995)	70.69	97.5% Chebyshev (MVUE) UCL	99.88
95% Modified-t UCL (Johnson-1978)	71.37	99% Chebyshev (MVUE) UCL	122.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.523	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.44		
MLE of Mean	61.57		
MLE of Standard Deviation	24.11		
nu star	195.7		
Approximate Chi Square Value (.05)	164.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	70.73
Adjusted Chi Square Value	160.8	95% Jackknife UCL	71.38
		95% Standard Bootstrap UCL	70.44
Anderson-Darling Test Statistic	0.909	95% Bootstrap-t UCL	71.79
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	70.25
Kolmogorov-Smirnov Test Statistic	0.261	95% Percentile Bootstrap UCL	70.62
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	70.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.85
		97.5% Chebyshev(Mean, Sd) UCL	96.35
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117
95% Approximate Gamma UCL	73.32		
95% Adjusted Gamma UCL	74.94		

Potential UCL to Use		Use 95% Student's-t UCL	71.38
		or 95% Modified-t UCL	71.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	65	Maximum of Log Data	4.174
Mean	60.56	Mean of log Data	4.037
Median	65	SD of log Data	0.481
SD	14.08		
Coefficient of Variation	0.233		
Skewness	-3.786		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.355	Shapiro Wilk Test Statistic	0.317
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.96	95% H-UCL	82.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.15
95% Adjusted-CLT UCL (Chen-1995)	62.74	97.5% Chebyshev (MVUE) UCL	113.3
95% Modified-t UCL (Johnson-1978)	66.37	99% Chebyshev (MVUE) UCL	143.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.206	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.758		
MLE of Mean	60.56		
MLE of Standard Deviation	24.31		
nu star	186.2		
Approximate Chi Square Value (.05)	155.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	66.54
Adjusted Chi Square Value	152.2	95% Jackknife UCL	66.96
		95% Standard Bootstrap UCL	66.41
Anderson-Darling Test Statistic	4.73	95% Bootstrap-t UCL	64.87
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	64.04
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	64.52
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	64.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.41
		97.5% Chebyshev(Mean, Sd) UCL	83.27
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	96.74
95% Approximate Gamma UCL	72.45		
95% Adjusted Gamma UCL	74.09		

Potential UCL to Use		
	Use 95% Student's-t UCL	66.96
	or 95% Modified-t UCL	66.37

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	32.28	Minimum of Log Data	3.474
Maximum	85	Maximum of Log Data	4.443
Mean	54.48	Mean of log Data	3.927
Median	43.52	SD of log Data	0.391
SD	22.19		
Coefficient of Variation	0.407		
Skewness	0.701		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.34	95% H-UCL	71.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	83.97
95% Adjusted-CLT UCL (Chen-1995)	67.68	97.5% Chebyshev (MVUE) UCL	96.79
95% Modified-t UCL (Johnson-1978)	67.6	99% Chebyshev (MVUE) UCL	122

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.121	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	10.64		
MLE of Mean	54.48		
MLE of Standard Deviation	24.07		
nu star	102.4		
Approximate Chi Square Value (.05)	80.06	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	66.02
Adjusted Chi Square Value	76.63	95% Jackknife UCL	67.34
		95% Standard Bootstrap UCL	65.53
Anderson-Darling Test Statistic	0.781	95% Bootstrap-t UCL	69.19
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	63.44
Kolmogorov-Smirnov Test Statistic	0.259	95% Percentile Bootstrap UCL	65.75
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	67.35
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	85.06
		97.5% Chebyshev(Mean, Sd) UCL	98.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124.3
95% Approximate Gamma UCL	69.68		
95% Adjusted Gamma UCL	72.8		

Potential UCL to Use		
	Use 95% Approximate Gamma UCL	69.68

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	12.4	Minimum of Log Data	2.518
Maximum	81.1	Maximum of Log Data	4.396
Mean	61.35	Mean of log Data	4.031
Median	65	SD of log Data	0.536
SD	17.93		
Coefficient of Variation	0.292		
Skewness	-2.632		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.537	Shapiro Wilk Test Statistic	0.449
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.74	95% H-UCL	97.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	112.2
95% Adjusted-CLT UCL (Chen-1995)	65.63	97.5% Chebyshev (MVUE) UCL	133.1
95% Modified-t UCL (Johnson-1978)	70.96	99% Chebyshev (MVUE) UCL	174.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.262	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.4		
MLE of Mean	61.35		
MLE of Standard Deviation	29.72		
nu star	85.23		
Approximate Chi Square Value (.05)	64.95	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	70.68
Adjusted Chi Square Value	61.88	95% Jackknife UCL	71.74
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.51	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.06
		97.5% Chebyshev(Mean, Sd) UCL	96.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117.8
95% Approximate Gamma UCL	80.51		
95% Adjusted Gamma UCL	84.5		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	86.06

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-06.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	30.92	Minimum of Log Data	3.431
Maximum	85	Maximum of Log Data	4.443
Mean	52.65	Mean of log Data	3.872
Median	41.8	SD of log Data	0.437
SD	24.28		
Coefficient of Variation	0.461		
Skewness	0.703		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.729	Shapiro Wilk Test Statistic	0.778
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.23	95% H-UCL	69.39
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.75
95% Adjusted-CLT UCL (Chen-1995)	65.69	97.5% Chebyshev (MVUE) UCL	94.45
95% Modified-t UCL (Johnson-1978)	65.47	99% Chebyshev (MVUE) UCL	119.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.286	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.28		
MLE of Mean	52.65		
MLE of Standard Deviation	25.43		
nu star	102.9		
Approximate Chi Square Value (.05)	80.46	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.18
Adjusted Chi Square Value	77.44	95% Jackknife UCL	65.23
		95% Standard Bootstrap UCL	63.76
Anderson-Darling Test Statistic	1.328	95% Bootstrap-t UCL	70.57
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	61.27
Kolmogorov-Smirnov Test Statistic	0.263	95% Percentile Bootstrap UCL	64.72
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.2
		97.5% Chebyshev(Mean, Sd) UCL	96.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	122.4
95% Approximate Gamma UCL	67.3		
95% Adjusted Gamma UCL	69.93		

Potential UCL to Use		
	Use 95% Student's-t UCL	65.23
	or 95% Modified-t UCL	65.47

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11.3	Minimum of Log Data	2.425
Maximum	98.09	Maximum of Log Data	4.586
Mean	63.28	Mean of log Data	4.063
Median	65	SD of log Data	0.529
SD	18.93		
Coefficient of Variation	0.299		
Skewness	-1.58		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.454
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.1	95% H-UCL	94.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	111.1
95% Adjusted-CLT UCL (Chen-1995)	69.61	97.5% Chebyshev (MVUE) UCL	130.7
95% Modified-t UCL (Johnson-1978)	72.68	99% Chebyshev (MVUE) UCL	169

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	4.603	Data do not follow a Discernable Distribution (0.05)		
Theta Star	13.75			
MLE of Mean	63.28			
MLE of Standard Deviation	29.5			
nu star	110.5			
Approximate Chi Square Value (.05)	87.21	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		72.27
Adjusted Chi Square Value	84.06	95% Jackknife UCL		73.1
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.109	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.497	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		87.11
		97.5% Chebyshev(Mean, Sd) UCL		97.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		117.7
95% Approximate Gamma UCL	80.16			
95% Adjusted Gamma UCL	83.17			

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	87.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-07.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	34.18	Minimum of Log Data	3.532
Maximum	85	Maximum of Log Data	4.443
Mean	57.89	Mean of log Data	3.976
Median	45.56	SD of log Data	0.423
SD	24.27		
Coefficient of Variation	0.419		
Skewness	0.301		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.726	Shapiro Wilk Test Statistic	0.756
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.47	95% H-UCL	75.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.21
95% Adjusted-CLT UCL (Chen-1995)	70.06	97.5% Chebyshev (MVUE) UCL	102.8
95% Modified-t UCL (Johnson-1978)	70.57	99% Chebyshev (MVUE) UCL	129.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.743	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.21		
MLE of Mean	57.89		
MLE of Standard Deviation	26.58		
nu star	113.8		
Approximate Chi Square Value (.05)	90.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.41
Adjusted Chi Square Value	86.99	95% Jackknife UCL	70.47
		95% Standard Bootstrap UCL	68.78
Anderson-Darling Test Statistic	1.429	95% Bootstrap-t UCL	72.21
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	67.77
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	68.8
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	69.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.43
		97.5% Chebyshev(Mean, Sd) UCL	101.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	127.6
95% Approximate Gamma UCL	73.06		
95% Adjusted Gamma UCL	75.75		

Potential UCL to Use		
	Use 95% Student's-t UCL	70.47
	or 95% Modified-t UCL	70.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.034	Minimum of Log Data	-3.381
Maximum	10	Maximum of Log Data	2.303
Mean	9.008	Mean of log Data	1.811
Median	10	SD of log Data	1.636
SD	2.881		
Coefficient of Variation	0.32		
Skewness	-3.26		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.408	Shapiro Wilk Test Statistic	0.344
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.5	95% H-UCL	183.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	61.73
95% Adjusted-CLT UCL (Chen-1995)	9.54	97.5% Chebyshev (MVUE) UCL	80.24
95% Modified-t UCL (Johnson-1978)	10.37	99% Chebyshev (MVUE) UCL	116.6

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.132	Data do not follow a Discernable Distribution (0.05)		
Theta Star	7.957			
MLE of Mean	9.008			
MLE of Standard Deviation	8.466			
nu star	27.17			
Approximate Chi Square Value (.05)	16.28	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		10.38
Adjusted Chi Square Value	15.01	95% Jackknife UCL		10.5
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	4.052	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.491	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12.63
		97.5% Chebyshev(Mean, Sd) UCL		14.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		17.28
95% Approximate Gamma UCL	15.03			
95% Adjusted Gamma UCL	16.31			

Potential UCL to Use	Use 99% Chebyshev (Mean, Sd) UCL	17.28

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-08.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	8.01	Minimum of Log Data	2.081
Maximum	13.8	Maximum of Log Data	2.625
Mean	10.91	Mean of log Data	2.383
Median	11	SD of log Data	0.12
SD	1.263		
Coefficient of Variation	0.116		
Skewness	-0.035		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.682
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.56	95% H-UCL	11.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.55
95% Adjusted-CLT UCL (Chen-1995)	11.5	97.5% Chebyshev (MVUE) UCL	13.26
95% Modified-t UCL (Johnson-1978)	11.56	99% Chebyshev (MVUE) UCL	14.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	58.93	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.185		
MLE of Mean	10.91		
MLE of Standard Deviation	1.421		
nu star	1414		
Approximate Chi Square Value (.05)	1328	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.51
Adjusted Chi Square Value	1315	95% Jackknife UCL	11.56
		95% Standard Bootstrap UCL	11.5
Anderson-Darling Test Statistic	2.1	95% Bootstrap-t UCL	11.52
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.7
Kolmogorov-Smirnov Test Statistic	0.379	95% Percentile Bootstrap UCL	11.47
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.45
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.5
		97.5% Chebyshev(Mean, Sd) UCL	13.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.53
95% Approximate Gamma UCL	11.61		
95% Adjusted Gamma UCL	11.73		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.56
	or 95% Modified-t UCL	11.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	17.7	Minimum of Log Data	2.874
Maximum	85	Maximum of Log Data	4.443
Mean	62.15	Mean of log Data	4.039
Median	66.77	SD of log Data	0.487
SD	23.83		
Coefficient of Variation	0.383		
Skewness	-0.5		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.854	Shapiro Wilk Test Statistic	0.821
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.5	95% H-UCL	87.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.8
95% Adjusted-CLT UCL (Chen-1995)	72.4	97.5% Chebyshev (MVUE) UCL	119.9
95% Modified-t UCL (Johnson-1978)	74.34	99% Chebyshev (MVUE) UCL	153.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.295	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	14.47		
MLE of Mean	62.15		
MLE of Standard Deviation	29.99		
nu star	103.1		
Approximate Chi Square Value (.05)	80.65	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	73.46
Adjusted Chi Square Value	77.62	95% Jackknife UCL	74.5
		95% Standard Bootstrap UCL	72.94
Anderson-Darling Test Statistic	0.786	95% Bootstrap-t UCL	73.36
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	72.11
Kolmogorov-Smirnov Test Statistic	0.238	95% Percentile Bootstrap UCL	72.74
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	72.24
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	92.13
		97.5% Chebyshev(Mean, Sd) UCL	105.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	130.6
95% Approximate Gamma UCL	79.43		
95% Adjusted Gamma UCL	82.53		

Potential UCL to Use		Use 95% Approximate Gamma UCL	79.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	18.8	Minimum of Log Data	2.934
Maximum	81.74	Maximum of Log Data	4.404
Mean	62.55	Mean of log Data	4.09
Median	65	SD of log Data	0.37
SD	14.59		
Coefficient of Variation	0.233		
Skewness	-2.685		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.507	Shapiro Wilk Test Statistic	0.43
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.11	95% H-UCL	79.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.61
95% Adjusted-CLT UCL (Chen-1995)	65.98	97.5% Chebyshev (MVUE) UCL	106.6
95% Modified-t UCL (Johnson-1978)	69.57	99% Chebyshev (MVUE) UCL	132.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.37	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.473		
MLE of Mean	62.55		
MLE of Standard Deviation	21.62		
nu star	200.9		
Approximate Chi Square Value (.05)	169.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.47
Adjusted Chi Square Value	164.6	95% Jackknife UCL	70.11
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.285	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.91
		97.5% Chebyshev(Mean, Sd) UCL	88.85
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.5
95% Approximate Gamma UCL	74.31		
95% Adjusted Gamma UCL	76.31		

Potential UCL to Use		
	Use 95% Student's-t UCL	70.11
	or 95% Modified-t UCL	69.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Vanadium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-10.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	6.6	Minimum of Log Data	1.887
Maximum	85	Maximum of Log Data	4.443
Mean	55.42	Mean of log Data	3.837
Median	42.92	SD of log Data	0.731
SD	27.74		
Coefficient of Variation	0.501		
Skewness	-0.0885		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.815	Shapiro Wilk Test Statistic	0.753
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.8	95% H-UCL	104.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	115.7
95% Adjusted-CLT UCL (Chen-1995)	68.37	97.5% Chebyshev (MVUE) UCL	140.2
95% Modified-t UCL (Johnson-1978)	69.77	99% Chebyshev (MVUE) UCL	188.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	24.3		
MLE of Mean	55.42		
MLE of Standard Deviation	36.7		
nu star	54.72		
Approximate Chi Square Value (.05)	38.72	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	68.59
Adjusted Chi Square Value	36.68	95% Jackknife UCL	69.8
		95% Standard Bootstrap UCL	68.15
Anderson-Darling Test Statistic	0.972	95% Bootstrap-t UCL	69.57
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	67.15
Kolmogorov-Smirnov Test Statistic	0.253	95% Percentile Bootstrap UCL	68.61
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	67.41
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	90.33
		97.5% Chebyshev(Mean, Sd) UCL	105.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	135.1
95% Approximate Gamma UCL	78.31		
95% Adjusted Gamma UCL	82.68		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	90.33

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	5.3	Minimum of Log Data	1.668
Maximum	74.02	Maximum of Log Data	4.304
Mean	60.78	Mean of log Data	3.976
Median	65	SD of log Data	0.728
SD	17.66		
Coefficient of Variation	0.291		
Skewness	-3.32		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.357
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.93	95% H-UCL	119.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	132.5
95% Adjusted-CLT UCL (Chen-1995)	63.94	97.5% Chebyshev (MVUE) UCL	160.5
95% Modified-t UCL (Johnson-1978)	69.12	99% Chebyshev (MVUE) UCL	215.5

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	3.04	Data do not follow a Discernable Distribution (0.05)		
Theta Star	19.99			
MLE of Mean	60.78			
MLE of Standard Deviation	34.86			
nu star	72.96			
Approximate Chi Square Value (.05)	54.29	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		69.16
Adjusted Chi Square Value	51.84	95% Jackknife UCL		69.93
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.827	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.536	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		83
		97.5% Chebyshev(Mean, Sd) UCL		92.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		111.5
95% Approximate Gamma UCL	81.68			
95% Adjusted Gamma UCL	85.54			
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL		83
Recommended UCL exceeds the maximum observation				

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.051	Minimum of Log Data	-2.976
Maximum	13.11	Maximum of Log Data	2.573
Mean	9.43	Mean of log Data	1.885
Median	10	SD of log Data	1.533
SD	3.086		
Coefficient of Variation	0.327		
Skewness	-2.871		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.488	Shapiro Wilk Test Statistic	0.357
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.03	95% H-UCL	133.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	55.84
95% Adjusted-CLT UCL (Chen-1995)	10.11	97.5% Chebyshev (MVUE) UCL	72.24
95% Modified-t UCL (Johnson-1978)	10.91	99% Chebyshev (MVUE) UCL	104.5

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	1.21	Data do not follow a Discernable Distribution (0.05)		
Theta Star	7.791			
MLE of Mean	9.43			
MLE of Standard Deviation	8.572			
nu star	29.05			
Approximate Chi Square Value (.05)	17.75	Nonparametric Statistics		
Adjusted Level of Significance	0.029	95% CLT UCL		10.9
Adjusted Chi Square Value	16.41	95% Jackknife UCL		11.03
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.907	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.551	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		13.31
		97.5% Chebyshev(Mean, Sd) UCL		14.99
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		18.29
95% Approximate Gamma UCL	15.44			
95% Adjusted Gamma UCL	16.69			

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.29

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-11.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Aluminum was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	7.54	Minimum of Log Data	2.02
Maximum	24.6	Maximum of Log Data	3.203
Mean	11.13	Mean of log Data	2.358
Median	11	SD of log Data	0.309
SD	4.489		
Coefficient of Variation	0.403		
Skewness	2.79		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.596	Shapiro Wilk Test Statistic	0.73
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.46	95% H-UCL	13.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.38
95% Adjusted-CLT UCL (Chen-1995)	14.38	97.5% Chebyshev (MVUE) UCL	17.25
95% Modified-t UCL (Johnson-1978)	13.63	99% Chebyshev (MVUE) UCL	20.94
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.433	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.497		
MLE of Mean	11.13		
MLE of Standard Deviation	4.082		
nu star	178.4		
Approximate Chi Square Value (.05)	148.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	13.26
Adjusted Chi Square Value	144.3	95% Jackknife UCL	13.46
		95% Standard Bootstrap UCL	13.18
Anderson-Darling Test Statistic	1.551	95% Bootstrap-t UCL	15.74
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	22.09
Kolmogorov-Smirnov Test Statistic	0.389	95% Percentile Bootstrap UCL	13.59
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	14.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.78
		97.5% Chebyshev(Mean, Sd) UCL	19.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.02
95% Approximate Gamma UCL	13.37		
95% Adjusted Gamma UCL	13.75		
Potential UCL to Use		Use 95% Student's-t UCL	13.46
		or 95% Modified-t UCL	13.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Barium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	32.91	Minimum of Log Data	3.494
Maximum	85	Maximum of Log Data	4.443
Mean	58.77	Mean of log Data	3.998
Median	48.11	SD of log Data	0.407
SD	23.59		
Coefficient of Variation	0.401		
Skewness	0.27		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71	95% H-UCL	76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.38
95% Adjusted-CLT UCL (Chen-1995)	70.54	97.5% Chebyshev (MVUE) UCL	102.6
95% Modified-t UCL (Johnson-1978)	71.09	99% Chebyshev (MVUE) UCL	128.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.13	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.46		
MLE of Mean	58.77		
MLE of Standard Deviation	25.95		
nu star	123.1		
Approximate Chi Square Value (.05)	98.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.97
Adjusted Chi Square Value	95.14	95% Jackknife UCL	71
		95% Standard Bootstrap UCL	69.33
Anderson-Darling Test Statistic	1.265	95% Bootstrap-t UCL	73.37
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	68.04
Kolmogorov-Smirnov Test Statistic	0.291	95% Percentile Bootstrap UCL	69.6
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	70.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.45
		97.5% Chebyshev(Mean, Sd) UCL	101.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.5
95% Approximate Gamma UCL	73.46		
95% Adjusted Gamma UCL	76.06		

Potential UCL to Use		
	Use 95% Student's-t UCL	71
	or 95% Modified-t UCL	71.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Iron

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	9455	Minimum of Log Data	9.154
Maximum	46000	Maximum of Log Data	10.74
Mean	14416	Mean of log Data	9.454
Median	10830	SD of log Data	0.44
SD	10199		
Coefficient of Variation	0.707		
Skewness	3.183		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.503	Shapiro Wilk Test Statistic	0.656
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19703	95% H-UCL	18503
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21801
95% Adjusted-CLT UCL (Chen-1995)	22149	97.5% Chebyshev (MVUE) UCL	25203
95% Modified-t UCL (Johnson-1978)	20154	99% Chebyshev (MVUE) UCL	31888

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.249	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4437		
MLE of Mean	14416		
MLE of Standard Deviation	7998		
nu star	77.97		
Approximate Chi Square Value (.05)	58.63	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	19258
Adjusted Chi Square Value	56.07	95% Jackknife UCL	19703
		95% Standard Bootstrap UCL	19163
Anderson-Darling Test Statistic	1.951	95% Bootstrap-t UCL	42354
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	37581
Kolmogorov-Smirnov Test Statistic	0.304	95% Percentile Bootstrap UCL	19927
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	22818
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	27249
		97.5% Chebyshev(Mean, Sd) UCL	32802
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43710
95% Approximate Gamma UCL	19171		
95% Adjusted Gamma UCL	20044		

Potential UCL to Use		
	Use 95% Student's-t UCL	19703
	or 95% Modified-t UCL	20154

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	38.9	Minimum of Log Data	3.661
Maximum	73.09	Maximum of Log Data	4.292
Mean	63.5	Mean of log Data	4.141
Median	65	SD of log Data	0.155
SD	8.088		
Coefficient of Variation	0.127		
Skewness	-2.88		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.487	Shapiro Wilk Test Statistic	0.451
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.69	95% H-UCL	69.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	76.02
95% Adjusted-CLT UCL (Chen-1995)	65.27	97.5% Chebyshev (MVUE) UCL	81.4
95% Modified-t UCL (Johnson-1978)	67.37	99% Chebyshev (MVUE) UCL	91.96

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	39.05	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.626		
MLE of Mean	63.5		
MLE of Standard Deviation	10.16		
nu star	937.3		
Approximate Chi Square Value (.05)	867.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	67.34
Adjusted Chi Square Value	856.9	95% Jackknife UCL	67.69
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.223	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.502	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.68
		97.5% Chebyshev(Mean, Sd) UCL	78.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	86.73
95% Approximate Gamma UCL	68.63		
95% Adjusted Gamma UCL	69.45		

Potential UCL to Use		
	Use 95% Student's-t UCL	67.69
	or 95% Modified-t UCL	67.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Vanadium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-12.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Beryllium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	30.41	Minimum of Log Data	3.415
Maximum	85	Maximum of Log Data	4.443
Mean	59.66	Mean of log Data	4.01
Median	48.19	SD of log Data	0.416
SD	23.58		
Coefficient of Variation	0.395		
Skewness	0.0859		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk Test Statistic	0.809
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.38	95% H-UCL	74.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88.32
95% Adjusted-CLT UCL (Chen-1995)	69.82	97.5% Chebyshev (MVUE) UCL	100.7
95% Modified-t UCL (Johnson-1978)	70.4	99% Chebyshev (MVUE) UCL	124.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.283	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.29		
MLE of Mean	59.66		
MLE of Standard Deviation	25.95		
nu star	158.5		
Approximate Chi Square Value (.05)	130.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	69.67
Adjusted Chi Square Value	127.3	95% Jackknife UCL	70.38
		95% Standard Bootstrap UCL	69.3
Anderson-Darling Test Statistic	1.4	95% Bootstrap-t UCL	70.76
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	68.96
Kolmogorov-Smirnov Test Statistic	0.262	95% Percentile Bootstrap UCL	69.76
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	69.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.19
		97.5% Chebyshev(Mean, Sd) UCL	97.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	120.2
95% Approximate Gamma UCL	72.52		
95% Adjusted Gamma UCL	74.3		

Potential UCL to Use		
	Use 95% Student's-t UCL	70.38
	or 95% Modified-t UCL	70.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	11.2	Minimum of Log Data	2.416
Maximum	68.97	Maximum of Log Data	4.234
Mean	61.4	Mean of log Data	4.057
Median	65	SD of log Data	0.455
SD	13.97		
Coefficient of Variation	0.228		
Skewness	-3.791		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.355	Shapiro Wilk Test Statistic	0.318
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.75	95% H-UCL	81.89
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.94
95% Adjusted-CLT UCL (Chen-1995)	63.56	97.5% Chebyshev (MVUE) UCL	111.4
95% Modified-t UCL (Johnson-1978)	67.16	99% Chebyshev (MVUE) UCL	139.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.762	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.079		
MLE of Mean	61.4		
MLE of Standard Deviation	23.61		
nu star	202.9		
Approximate Chi Square Value (.05)	170.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	67.33
Adjusted Chi Square Value	167.3	95% Jackknife UCL	67.75
		95% Standard Bootstrap UCL	67.08
Anderson-Darling Test Statistic	4.827	95% Bootstrap-t UCL	65.88
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	65.05
Kolmogorov-Smirnov Test Statistic	0.478	95% Percentile Bootstrap UCL	65.26
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	64.98
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.12
		97.5% Chebyshev(Mean, Sd) UCL	83.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	97.29
95% Approximate Gamma UCL	72.87		
95% Adjusted Gamma UCL	74.45		

Potential UCL to Use			
		Use 95% Student's-t UCL	67.75
		or 95% Modified-t UCL	67.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-13.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	36.31	Minimum of Log Data	3.592
Maximum	85	Maximum of Log Data	4.443
Mean	68.62	Mean of log Data	4.182
Median	85	SD of log Data	0.333
SD	20.08		
Coefficient of Variation	0.293		
Skewness	-0.62		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.761	Shapiro Wilk Test Statistic	0.765
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	78.54	95% H-UCL	83.37
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.96
95% Adjusted-CLT UCL (Chen-1995)	76.75	97.5% Chebyshev (MVUE) UCL	109.1
95% Modified-t UCL (Johnson-1978)	78.38	99% Chebyshev (MVUE) UCL	133

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.357	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.211		
MLE of Mean	68.62		
MLE of Standard Deviation	23.74		
nu star	217.3		
Approximate Chi Square Value (.05)	184.2	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	77.78
Adjusted Chi Square Value	179.8	95% Jackknife UCL	78.54
		95% Standard Bootstrap UCL	77.71
Anderson-Darling Test Statistic	1.45	95% Bootstrap-t UCL	77.32
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	76.13
Kolmogorov-Smirnov Test Statistic	0.335	95% Percentile Bootstrap UCL	77.01
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	77.07
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	92.89
		97.5% Chebyshev(Mean, Sd) UCL	103.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124
95% Approximate Gamma UCL	80.96		
95% Adjusted Gamma UCL	82.91		

Potential UCL to Use		
	Use 95% Student's-t UCL	78.54
	or 95% Modified-t UCL	78.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11.3	Minimum of Log Data	2.425
Maximum	73.51	Maximum of Log Data	4.297
Mean	61.52	Mean of log Data	4.049
Median	65	SD of log Data	0.489
SD	15.27		
Coefficient of Variation	0.248		
Skewness	-3.44		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.397	Shapiro Wilk Test Statistic	0.351
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	69.07	95% H-UCL	86.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.8
95% Adjusted-CLT UCL (Chen-1995)	64.17	97.5% Chebyshev (MVUE) UCL	119.6
95% Modified-t UCL (Johnson-1978)	68.4	99% Chebyshev (MVUE) UCL	152.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.659	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.87		
MLE of Mean	61.52		
MLE of Standard Deviation	25.86		
nu star	147.1		
Approximate Chi Square Value (.05)	120.1	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	68.49
Adjusted Chi Square Value	116.6	95% Jackknife UCL	69.07
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.101	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.531	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.99
		97.5% Chebyshev(Mean, Sd) UCL	87.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	103.7
95% Approximate Gamma UCL	75.37		
95% Adjusted Gamma UCL	77.62		

Potential UCL to Use		
	Use 95% Student's-t UCL	69.07
	or 95% Modified-t UCL	68.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-14.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	18.2	Minimum of Log Data	2.901
Maximum	85	Maximum of Log Data	4.443
Mean	63.66	Mean of log Data	4.043
Median	85	SD of log Data	0.535
SD	26.27		
Coefficient of Variation	0.413		
Skewness	-0.66		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.771	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	76.64	95% H-UCL	91.67
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	108.2
95% Adjusted-CLT UCL (Chen-1995)	74.22	97.5% Chebyshev (MVUE) UCL	126.9
95% Modified-t UCL (Johnson-1978)	76.42	99% Chebyshev (MVUE) UCL	163.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.652	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.43		
MLE of Mean	63.66		
MLE of Standard Deviation	33.31		
nu star	94.94		
Approximate Chi Square Value (.05)	73.47	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	75.64
Adjusted Chi Square Value	70.78	95% Jackknife UCL	76.64
		95% Standard Bootstrap UCL	75.53
Anderson-Darling Test Statistic	1.378	95% Bootstrap-t UCL	75.01
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	73.65
Kolmogorov-Smirnov Test Statistic	0.329	95% Percentile Bootstrap UCL	74.73
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	74.72
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.42
		97.5% Chebyshev(Mean, Sd) UCL	109.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	136.2
95% Approximate Gamma UCL	82.26		
95% Adjusted Gamma UCL	85.38		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	95.42

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	57.88	Minimum of Log Data	4.058
Maximum	82.18	Maximum of Log Data	4.409
Mean	67.2	Mean of log Data	4.204
Median	65	SD of log Data	0.0905
SD	6.388		
Coefficient of Variation	0.095		
Skewness	1.477		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.715	Shapiro Wilk Test Statistic	0.733
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.36	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	74.55
95% Adjusted-CLT UCL (Chen-1995)	70.89	97.5% Chebyshev (MVUE) UCL	77.73
95% Modified-t UCL (Johnson-1978)	70.48	99% Chebyshev (MVUE) UCL	83.99

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	98.72	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.681		
MLE of Mean	67.2		
MLE of Standard Deviation	6.763		
nu star	2567		
Approximate Chi Square Value (.05)	2450	Nonparametric Statistics	
Adjusted Level of Significance	0.03	95% CLT UCL	70.11
Adjusted Chi Square Value	2434	95% Jackknife UCL	70.36
		95% Standard Bootstrap UCL	69.92
Anderson-Darling Test Statistic	1.995	95% Bootstrap-t UCL	73.19
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	92.58
Kolmogorov-Smirnov Test Statistic	0.404	95% Percentile Bootstrap UCL	70.1
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	70.78
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.92
		97.5% Chebyshev(Mean, Sd) UCL	78.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	84.83
95% Approximate Gamma UCL	70.4		
95% Adjusted Gamma UCL	70.87		

Potential UCL to Use		
	Use 95% Student's-t UCL	70.36
	or 95% Modified-t UCL	70.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-15.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	8	Minimum of Log Data	2.079
Maximum	85	Maximum of Log Data	4.443
Mean	59.78	Mean of log Data	3.935
Median	66.59	SD of log Data	0.671
SD	27.63		
Coefficient of Variation	0.462		
Skewness	-0.39		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.797	Shapiro Wilk Test Statistic	0.755
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.86	95% H-UCL	98.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	114.4
95% Adjusted-CLT UCL (Chen-1995)	71.1	97.5% Chebyshev (MVUE) UCL	136.7
95% Modified-t UCL (Johnson-1978)	72.73	99% Chebyshev (MVUE) UCL	180.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.699	Data do not follow a Discernable Distribution (0.05)	
Theta Star	22.15		
MLE of Mean	59.78		
MLE of Standard Deviation	36.39		
nu star	75.56		
Approximate Chi Square Value (.05)	56.54	Nonparametric Statistics	
Adjusted Level of Significance	0.031	95% CLT UCL	71.93
Adjusted Chi Square Value	54.36	95% Jackknife UCL	72.86
		95% Standard Bootstrap UCL	71.47
Anderson-Darling Test Statistic	1.199	95% Bootstrap-t UCL	71.82
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	70.9
Kolmogorov-Smirnov Test Statistic	0.306	95% Percentile Bootstrap UCL	71.57
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	70.48
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.97
		97.5% Chebyshev(Mean, Sd) UCL	105.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	133.3
95% Approximate Gamma UCL	79.9		
95% Adjusted Gamma UCL	83.1		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	91.97

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	195-16.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	35.25	Minimum of Log Data	3.562
Maximum	85	Maximum of Log Data	4.443
Mean	73.72	Mean of log Data	4.253
Median	85	SD of log Data	0.343
SD	20.26		
Coefficient of Variation	0.275		
Skewness	-1.304		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.571	Shapiro Wilk Test Statistic	0.58
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	82.59	95% H-UCL	88.22
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	102.4
95% Adjusted-CLT UCL (Chen-1995)	80.28	97.5% Chebyshev (MVUE) UCL	114.6
95% Modified-t UCL (Johnson-1978)	82.32	99% Chebyshev (MVUE) UCL	138.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.691	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.482		
MLE of Mean	73.72		
MLE of Standard Deviation	25.01		
nu star	278.1		
Approximate Chi Square Value (.05)	240.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	82.05
Adjusted Chi Square Value	236.5	95% Jackknife UCL	82.59
		95% Standard Bootstrap UCL	81.54
Anderson-Darling Test Statistic	3.605	95% Bootstrap-t UCL	81.08
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	80.33
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	81.89
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	79.63
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.79
		97.5% Chebyshev(Mean, Sd) UCL	105.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	124.1
95% Approximate Gamma UCL	85.25		
95% Adjusted Gamma UCL	86.68		

Potential UCL to Use		
	Use 95% Student's-t UCL	82.59
	or 95% Modified-t UCL	82.32

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	16	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	7.6	Minimum of Log Data	2.028
Maximum	85.7	Maximum of Log Data	4.451
Mean	63.96	Mean of log Data	4.075
Median	65	SD of log Data	0.552
SD	16.16		
Coefficient of Variation	0.253		
Skewness	-2.992		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.528	Shapiro Wilk Test Statistic	0.376
Shapiro Wilk Critical Value	0.887	Shapiro Wilk Critical Value	0.887
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.04	95% H-UCL	92.55
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	110.2
95% Adjusted-CLT UCL (Chen-1995)	67.38	97.5% Chebyshev (MVUE) UCL	128.5
95% Modified-t UCL (Johnson-1978)	70.54	99% Chebyshev (MVUE) UCL	164.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.077	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.6		
MLE of Mean	63.96		
MLE of Standard Deviation	28.39		
nu star	162.5		
Approximate Chi Square Value (.05)	134	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	70.6
Adjusted Chi Square Value	131	95% Jackknife UCL	71.04
		95% Standard Bootstrap UCL	70.49
Anderson-Darling Test Statistic	4.203	95% Bootstrap-t UCL	69.02
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	68.4
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	69.37
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	68.35
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.57
		97.5% Chebyshev(Mean, Sd) UCL	89.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.2
95% Approximate Gamma UCL	77.55		
95% Adjusted Gamma UCL	79.29		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	81.57

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options			
From File	195-17.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Chromium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	33.69	Minimum of Log Data	3.517
Maximum	120.8	Maximum of Log Data	4.794
Mean	73.86	Mean of log Data	4.244
Median	85	SD of log Data	0.369
SD	23.2		
Coefficient of Variation	0.314		
Skewness	-0.45		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.818	Shapiro Wilk Test Statistic	0.782
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	82.17	95% H-UCL	86.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.84
95% Adjusted-CLT UCL (Chen-1995)	81.34	97.5% Chebyshev (MVUE) UCL	110.9
95% Modified-t UCL (Johnson-1978)	82.09	99% Chebyshev (MVUE) UCL	132.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.644	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.663		
MLE of Mean	73.86		
MLE of Standard Deviation	26.72		
nu star	351.6		
Approximate Chi Square Value (.05)	309.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	81.82
Adjusted Chi Square Value	306.3	95% Jackknife UCL	82.17
		95% Standard Bootstrap UCL	81.85
Anderson-Darling Test Statistic	2.574	95% Bootstrap-t UCL	81.8
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	81.1
Kolmogorov-Smirnov Test Statistic	0.357	95% Percentile Bootstrap UCL	81.46
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	81
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.95
		97.5% Chebyshev(Mean, Sd) UCL	104.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	122
95% Approximate Gamma UCL	84.01		
95% Adjusted Gamma UCL	84.8		

Potential UCL to Use		
	Use 95% Student's-t UCL	82.17
	or 95% Modified-t UCL	82.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.417	Minimum of Log Data	-0.875
Maximum	10	Maximum of Log Data	2.303
Mean	9.564	Mean of log Data	2.163
Median	10	SD of log Data	0.662
SD	1.996		
Coefficient of Variation	0.209		
Skewness	-4.78		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.23	Shapiro Wilk Test Statistic	0.22
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.28	95% H-UCL	14.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.57
95% Adjusted-CLT UCL (Chen-1995)	9.806	97.5% Chebyshev (MVUE) UCL	20.54
95% Modified-t UCL (Johnson-1978)	10.21	99% Chebyshev (MVUE) UCL	26.37

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.72	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.026		
MLE of Mean	9.564		
MLE of Standard Deviation	4.402		
nu star	217.1		
Approximate Chi Square Value (.05)	184	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.25
Adjusted Chi Square Value	181.8	95% Jackknife UCL	10.28
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	8.394	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.514	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.38
		97.5% Chebyshev(Mean, Sd) UCL	12.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.71
95% Approximate Gamma UCL	11.28		
95% Adjusted Gamma UCL	11.42		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.38

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	51	Minimum of Log Data	3.932
Maximum	65	Maximum of Log Data	4.174
Mean	63.73	Mean of log Data	4.153
Median	65	SD of log Data	0.0588
SD	3.453		
Coefficient of Variation	0.0542		
Skewness	-2.978		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.43
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	64.96	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	67.14
95% Adjusted-CLT UCL (Chen-1995)	64.43	97.5% Chebyshev (MVUE) UCL	68.61
95% Modified-t UCL (Johnson-1978)	64.89	99% Chebyshev (MVUE) UCL	71.51

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	278.1	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.229		
MLE of Mean	63.73		
MLE of Standard Deviation	3.821		
nu star	12793		
Approximate Chi Square Value (.05)	12531	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	64.91
Adjusted Chi Square Value	12512	95% Jackknife UCL	64.96
		95% Standard Bootstrap UCL	64.87
Anderson-Darling Test Statistic	6.102	95% Bootstrap-t UCL	64.67
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	64.53
Kolmogorov-Smirnov Test Statistic	0.472	95% Percentile Bootstrap UCL	64.64
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	64.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	66.86
		97.5% Chebyshev(Mean, Sd) UCL	68.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	70.89
95% Approximate Gamma UCL	65.06		
95% Adjusted Gamma UCL	65.16		

Potential UCL to Use		
	Use 95% Student's-t UCL	64.96
	or 95% Modified-t UCL	64.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.74	Minimum of Log Data	-0.301
Maximum	5	Maximum of Log Data	1.609
Mean	4.806	Mean of log Data	1.525
Median	5	SD of log Data	0.398
SD	0.887		
Coefficient of Variation	0.185		
Skewness	-4.78		

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.23	Shapiro Wilk Test Statistic	0.222
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.124	95% H-UCL	5.838
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.793
95% Adjusted-CLT UCL (Chen-1995)	4.914	97.5% Chebyshev (MVUE) UCL	7.588
95% Modified-t UCL (Johnson-1978)	5.093	99% Chebyshev (MVUE) UCL	9.151

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.772	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.492		
MLE of Mean	4.806		
MLE of Standard Deviation	1.538		
nu star	449.5		
Approximate Chi Square Value (.05)	401.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	5.111
Adjusted Chi Square Value	398.1	95% Jackknife UCL	5.124
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	8.272	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.613
		97.5% Chebyshev(Mean, Sd) UCL	5.962
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.647
95% Approximate Gamma UCL	5.383		
95% Adjusted Gamma UCL	5.428		

Potential UCL to Use		
	Use 95% Student's-t UCL	5.124
	or 95% Modified-t UCL	5.093

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.59	Minimum of Log Data	-0.528
Maximum	10.14	Maximum of Log Data	2.316
Mean	9.579	Mean of log Data	2.178
Median	10	SD of log Data	0.59
SD	1.962		
Coefficient of Variation	0.205		
Skewness	-4.778		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.236	Shapiro Wilk Test Statistic	0.223
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.28	95% H-UCL	13.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.3
95% Adjusted-CLT UCL (Chen-1995)	9.816	97.5% Chebyshev (MVUE) UCL	18.85
95% Modified-t UCL (Johnson-1978)	10.21	99% Chebyshev (MVUE) UCL	23.85

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.52	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.735		
MLE of Mean	9.579		
MLE of Standard Deviation	4.077		
nu star	253.9		
Approximate Chi Square Value (.05)	218	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	10.25
Adjusted Chi Square Value	215.6	95% Jackknife UCL	10.28
		95% Standard Bootstrap UCL	10.26
Anderson-Darling Test Statistic	8.311	95% Bootstrap-t UCL	10.07
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	9.985
Kolmogorov-Smirnov Test Statistic	0.509	95% Percentile Bootstrap UCL	10.01
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	9.988
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.36
		97.5% Chebyshev(Mean, Sd) UCL	12.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.65
95% Approximate Gamma UCL	11.16		
95% Adjusted Gamma UCL	11.28		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.36
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	541-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	7240	Minimum of Log Data	8.887
Maximum	19200	Maximum of Log Data	9.863
Mean	14049	Mean of log Data	9.534
Median	14049	SD of log Data	0.195
SD	2411		
Coefficient of Variation	0.172		
Skewness	-0.789		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.927	Shapiro Wilk Test Statistic	0.85
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14913	95% H-UCL	15154
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16583
95% Adjusted-CLT UCL (Chen-1995)	14788	97.5% Chebyshev (MVUE) UCL	17669
95% Modified-t UCL (Johnson-1978)	14899	99% Chebyshev (MVUE) UCL	19803

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.47	Data appear Normal at 5% Significance Level	
Theta Star	530.7		
MLE of Mean	14049		
MLE of Standard Deviation	2731		
nu star	1218		
Approximate Chi Square Value (.05)	1138	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	14876
Adjusted Chi Square Value	1132	95% Jackknife UCL	14913
		95% Standard Bootstrap UCL	14863
Anderson-Darling Test Statistic	0.986	95% Bootstrap-t UCL	14811
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	14835
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	14842
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	14756
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16241
		97.5% Chebyshev(Mean, Sd) UCL	17190
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19053
95% Approximate Gamma UCL	15038		
95% Adjusted Gamma UCL	15112		

Potential UCL to Use			
		Use 95% Student's-t UCL	14913

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Americium-241

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics
Minimum	-0.00445	Log Statistics Not Avaliable
Maximum	27.3	
Mean	2.25	
Median	0.00483	
SD	5.812	
Coefficient of Variation	2.583	
Skewness	4.023	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.418	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	4.331	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	4.331	95% Adjusted-CLT UCL (Chen 1995)		5.33
		95% Modified-t UCL (Johnson-1978)		4.5

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	7.532	95% CLT UCL	4.243
		95% Jackknife UCL	4.331
		95% Standard Bootstrap UCL	4.247
		95% Bootstrap-t UCL	11.03
		95% Hall's Bootstrap UCL	12.88
		95% Percentile Bootstrap UCL	4.424
		95% BCA Bootstrap UCL	5.925
		95% Chebyshev(Mean, Sd) UCL	7.532
		97.5% Chebyshev(Mean, Sd) UCL	9.818
		99% Chebyshev(Mean, Sd) UCL	14.31

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	1.87	Minimum of Log Data	0.626
Maximum	23.3	Maximum of Log Data	3.148
Mean	7.701	Mean of log Data	1.954
Median	7.29	SD of log Data	0.423
SD	3.847		
Coefficient of Variation	0.5		
Skewness	3.16		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.633	Shapiro Wilk Test Statistic	0.799
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.079	95% H-UCL	9.171
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.73
95% Adjusted-CLT UCL (Chen-1995)	9.585	97.5% Chebyshev (MVUE) UCL	12.04
95% Modified-t UCL (Johnson-1978)	9.167	99% Chebyshev (MVUE) UCL	14.63

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.171	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.489		
MLE of Mean	7.701		
MLE of Standard Deviation	3.387		
nu star	237.9		
Approximate Chi Square Value (.05)	203.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	9.021
Adjusted Chi Square Value	200.9	95% Jackknife UCL	9.079
		95% Standard Bootstrap UCL	8.967
Anderson-Darling Test Statistic	1.909	95% Bootstrap-t UCL	10.42
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	15.87
Kolmogorov-Smirnov Test Statistic	0.265	95% Percentile Bootstrap UCL	9.095
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	9.782
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.2
		97.5% Chebyshev(Mean, Sd) UCL	12.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.68
95% Approximate Gamma UCL	9.017		
95% Adjusted Gamma UCL	9.121		

Potential UCL to Use		
	Use 95% Student's-t UCL	9.079
	or 95% Modified-t UCL	9.167

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	71.4	Minimum of Log Data	4.268
Maximum	230	Maximum of Log Data	5.438
Mean	123.6	Mean of log Data	4.784
Median	123.6	SD of log Data	0.256
SD	34.43		
Coefficient of Variation	0.279		
Skewness	1.537		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.849	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	135.9	95% H-UCL	136.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	152.5
95% Adjusted-CLT UCL (Chen-1995)	137.9	97.5% Chebyshev (MVUE) UCL	165
95% Modified-t UCL (Johnson-1978)	136.3	99% Chebyshev (MVUE) UCL	189.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.46	Data appear Lognormal at 5% Significance Level	
Theta Star	9.18		
MLE of Mean	123.6		
MLE of Standard Deviation	33.68		
nu star	619.3		
Approximate Chi Square Value (.05)	562.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	135.4
Adjusted Chi Square Value	558.7	95% Jackknife UCL	135.9
		95% Standard Bootstrap UCL	135.4
Anderson-Darling Test Statistic	0.949	95% Bootstrap-t UCL	139.8
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	148.1
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	135.2
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	137.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	154.9
		97.5% Chebyshev(Mean, Sd) UCL	168.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	195
95% Approximate Gamma UCL	136.1		
95% Adjusted Gamma UCL	137		

Potential UCL to Use		
	Use 95% Student's-t UCL	135.9
	or 95% Modified-t UCL	136.3
	or 95% H-UCL	136.3

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.424	Minimum of Log Data	-0.858
Maximum	1.46	Maximum of Log Data	0.378
Mean	0.645	Mean of log Data	-0.5
Median	0.577	SD of log Data	0.333
SD	0.267		
Coefficient of Variation	0.414		
Skewness	2.048		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.728	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.74	95% H-UCL	0.731
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.837
95% Adjusted-CLT UCL (Chen-1995)	0.762	97.5% Chebyshev (MVUE) UCL	0.923
95% Modified-t UCL (Johnson-1978)	0.744	99% Chebyshev (MVUE) UCL	1.09

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.303	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0883		
MLE of Mean	0.645		
MLE of Standard Deviation	0.239		
nu star	335.9		
Approximate Chi Square Value (.05)	294.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.736
Adjusted Chi Square Value	291.7	95% Jackknife UCL	0.74
		95% Standard Bootstrap UCL	0.736
Anderson-Darling Test Statistic	1.601	95% Bootstrap-t UCL	0.799
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.827
Kolmogorov-Smirnov Test Statistic	0.28	95% Percentile Bootstrap UCL	0.74
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.759
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.887
		97.5% Chebyshev(Mean, Sd) UCL	0.992
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.198
95% Approximate Gamma UCL	0.736		
95% Adjusted Gamma UCL	0.743		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.74
	or 95% Modified-t UCL	0.744

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.481	Minimum of Log Data	-0.732
Maximum	2.75	Maximum of Log Data	1.012
Mean	1.303	Mean of log Data	0.122
Median	1.303	SD of log Data	0.557
SD	0.701		
Coefficient of Variation	0.538		
Skewness	0.663		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.924
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.555	95% H-UCL	1.677
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.003
95% Adjusted-CLT UCL (Chen-1995)	1.566	97.5% Chebyshev (MVUE) UCL	2.304
95% Modified-t UCL (Johnson-1978)	1.558	99% Chebyshev (MVUE) UCL	2.894

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.2	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.407		
MLE of Mean	1.303		
MLE of Standard Deviation	0.729		
nu star	147.2		
Approximate Chi Square Value (.05)	120.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	1.544
Adjusted Chi Square Value	118.4	95% Jackknife UCL	1.555
		95% Standard Bootstrap UCL	1.54
Anderson-Darling Test Statistic	0.695	95% Bootstrap-t UCL	1.574
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	1.559
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	1.536
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	1.573
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.941
		97.5% Chebyshev(Mean, Sd) UCL	2.217
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.759
95% Approximate Gamma UCL	1.597		
95% Adjusted Gamma UCL	1.621		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1.597

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	0.0117	Minimum of Log Data	-4.448
Maximum	2.33	Maximum of Log Data	0.846
Mean	0.456	Mean of log Data	-1.302
Median	0.251	SD of log Data	1.084
SD	0.567		
Coefficient of Variation	1.242		
Skewness	2.589		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.625	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.659	95% H-UCL	0.901
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.004
95% Adjusted-CLT UCL (Chen-1995)	0.719	97.5% Chebyshev (MVUE) UCL	1.234
95% Modified-t UCL (Johnson-1978)	0.67	99% Chebyshev (MVUE) UCL	1.687

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.988	Data appear Lognormal at 5% Significance Level	
Theta Star	0.462		
MLE of Mean	0.456		
MLE of Standard Deviation	0.459		
nu star	45.47		
Approximate Chi Square Value (.05)	31	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.651
Adjusted Chi Square Value	30.13	95% Jackknife UCL	0.659
		95% Standard Bootstrap UCL	0.646
Anderson-Darling Test Statistic	1.055	95% Bootstrap-t UCL	0.955
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	1.597
Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	0.658
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	0.713
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.972
		97.5% Chebyshev(Mean, Sd) UCL	1.195
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.632
95% Approximate Gamma UCL	0.669		
95% Adjusted Gamma UCL	0.689		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.972

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	22

Raw Statistics		Log-transformed Statistics	
Minimum	10.8	Minimum of Log Data	2.38
Maximum	3353	Maximum of Log Data	8.117
Mean	614.9	Mean of log Data	5.768
Median	463.9	SD of log Data	1.341
SD	719		
Coefficient of Variation	1.169		
Skewness	2.687		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.721	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	872.4	95% H-UCL	1859
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1806
95% Adjusted-CLT UCL (Chen-1995)	951.3	97.5% Chebyshev (MVUE) UCL	2269
95% Modified-t UCL (Johnson-1978)	886.4	99% Chebyshev (MVUE) UCL	3179

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.807	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	761.6		
MLE of Mean	614.9		
MLE of Standard Deviation	684.4		
nu star	37.14		
Approximate Chi Square Value (.05)	24.19	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	861.5
Adjusted Chi Square Value	23.43	95% Jackknife UCL	872.4
		95% Standard Bootstrap UCL	858.7
Anderson-Darling Test Statistic	0.22	95% Bootstrap-t UCL	1039
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	1997
Kolmogorov-Smirnov Test Statistic	0.0906	95% Percentile Bootstrap UCL	893
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	959.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1268
		97.5% Chebyshev(Mean, Sd) UCL	1551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2107
95% Approximate Gamma UCL	944.2		
95% Adjusted Gamma UCL	974.8		

Potential UCL to Use		Use 95% Approximate Gamma UCL	944.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics
Minimum	-0.00942	Log Statistics Not Avaliable
Maximum	0.0183	
Mean	0.00626	
Median	0.00626	
SD	0.00424	
Coefficient of Variation	0.677	
Skewness	-1.373	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.465	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.00778	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.00778	95% Adjusted-CLT UCL (Chen 1995)		0.00744
		95% Modified-t UCL (Johnson-1978)		0.00773

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0101	95% CLT UCL	0.00771
		95% Jackknife UCL	0.00778
		95% Standard Bootstrap UCL	0.00766
		95% Bootstrap-t UCL	0.00743
		95% Hall's Bootstrap UCL	0.00764
		95% Percentile Bootstrap UCL	0.00757
		95% BCA Bootstrap UCL	0.00737
		95% Chebyshev(Mean, Sd) UCL	0.0101
		97.5% Chebyshev(Mean, Sd) UCL	0.0118
		99% Chebyshev(Mean, Sd) UCL	0.0151

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	9980	Minimum of Log Data	9.208
Maximum	29600	Maximum of Log Data	10.3
Mean	17134	Mean of log Data	9.716
Median	17134	SD of log Data	0.255
SD	4708		
Coefficient of Variation	0.275		
Skewness	1.344		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.929
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18820	95% H-UCL	18894
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21124
95% Adjusted-CLT UCL (Chen-1995)	19043	97.5% Chebyshev (MVUE) UCL	22860
95% Modified-t UCL (Johnson-1978)	18866	99% Chebyshev (MVUE) UCL	26269

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.62	Data appear Lognormal at 5% Significance Level	
Theta Star	1258		
MLE of Mean	17134		
MLE of Standard Deviation	4643		
nu star	626.4		
Approximate Chi Square Value (.05)	569.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	18749
Adjusted Chi Square Value	565.4	95% Jackknife UCL	18820
		95% Standard Bootstrap UCL	18687
Anderson-Darling Test Statistic	0.867	95% Bootstrap-t UCL	19211
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	20343
Kolmogorov-Smirnov Test Statistic	0.186	95% Percentile Bootstrap UCL	18819
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	19273
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21413
		97.5% Chebyshev(Mean, Sd) UCL	23265
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26902
95% Approximate Gamma UCL	18851		
95% Adjusted Gamma UCL	18983		

Potential UCL to Use		
	Use 95% Student's-t UCL	18820
	or 95% Modified-t UCL	18866
	or 95% H-UCL	18894

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	104	Minimum of Log Data	4.644
Maximum	821	Maximum of Log Data	6.711
Mean	441.9	Mean of log Data	6.02
Median	441.9	SD of log Data	0.422
SD	153.2		
Coefficient of Variation	0.347		
Skewness	0.323		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.943	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	496.7	95% H-UCL	534
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	624.6
95% Adjusted-CLT UCL (Chen-1995)	496.7	97.5% Chebyshev (MVUE) UCL	701
95% Modified-t UCL (Johnson-1978)	497.1	99% Chebyshev (MVUE) UCL	851.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.28	Data appear Normal at 5% Significance Level	
Theta Star	70.36		
MLE of Mean	441.9		
MLE of Standard Deviation	176.3		
nu star	288.9		
Approximate Chi Square Value (.05)	250.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	494.4
Adjusted Chi Square Value	247.9	95% Jackknife UCL	496.7
		95% Standard Bootstrap UCL	495.8
Anderson-Darling Test Statistic	0.889	95% Bootstrap-t UCL	500.2
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	511.2
Kolmogorov-Smirnov Test Statistic	0.202	95% Percentile Bootstrap UCL	493.8
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	492.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	581.1
		97.5% Chebyshev(Mean, Sd) UCL	641.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	759.8
95% Approximate Gamma UCL	509.6		
95% Adjusted Gamma UCL	514.9		

Potential UCL to Use			
		Use 95% Student's-t UCL	496.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.019	Minimum of Log Data	-3.963
Maximum	0.67	Maximum of Log Data	-0.4
Mean	0.0774	Mean of log Data	-3.109
Median	0.029	SD of log Data	0.868
SD	0.137		
Coefficient of Variation	1.77		
Skewness	4.069		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.423	Shapiro Wilk Test Statistic	0.8
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.126	95% H-UCL	0.101
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.119
95% Adjusted-CLT UCL (Chen-1995)	0.15	97.5% Chebyshev (MVUE) UCL	0.143
95% Modified-t UCL (Johnson-1978)	0.13	99% Chebyshev (MVUE) UCL	0.19

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.938	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0825		
MLE of Mean	0.0774		
MLE of Standard Deviation	0.0799		
nu star	43.15		
Approximate Chi Square Value (.05)	29.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.124
Adjusted Chi Square Value	28.25	95% Jackknife UCL	0.126
		95% Standard Bootstrap UCL	0.122
Anderson-Darling Test Statistic	2.626	95% Bootstrap-t UCL	0.297
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	0.326
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	0.128
Kolmogorov-Smirnov 5% Critical Value	0.187	95% BCA Bootstrap UCL	0.162
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.202
		97.5% Chebyshev(Mean, Sd) UCL	0.256
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.361
95% Approximate Gamma UCL	0.115		
95% Adjusted Gamma UCL	0.118		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.202

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.46	Minimum of Log Data	-0.777
Maximum	1.8	Maximum of Log Data	0.588
Mean	0.555	Mean of log Data	-0.642
Median	0.49	SD of log Data	0.278
SD	0.274		
Coefficient of Variation	0.493		
Skewness	4.658		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.319	Shapiro Wilk Test Statistic	0.426
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.653	95% H-UCL	0.608
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.685
95% Adjusted-CLT UCL (Chen-1995)	0.708	97.5% Chebyshev (MVUE) UCL	0.745
95% Modified-t UCL (Johnson-1978)	0.663	99% Chebyshev (MVUE) UCL	0.864

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.202	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0677		
MLE of Mean	0.555		
MLE of Standard Deviation	0.194		
nu star	377.3		
Approximate Chi Square Value (.05)	333.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.649
Adjusted Chi Square Value	330.3	95% Jackknife UCL	0.653
		95% Standard Bootstrap UCL	0.648
Anderson-Darling Test Statistic	5.176	95% Bootstrap-t UCL	1.099
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	1.014
Kolmogorov-Smirnov Test Statistic	0.413	95% Percentile Bootstrap UCL	0.666
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.728
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.804
		97.5% Chebyshev(Mean, Sd) UCL	0.912
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.123
95% Approximate Gamma UCL	0.629		
95% Adjusted Gamma UCL	0.634		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.653
	or 95% Modified-t UCL	0.663

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics
Minimum	-0.0122	Log Statistics Not Avaliable
Maximum	0.181	
Mean	0.0196	
Median	0.00651	
SD	0.041	
Coefficient of Variation	2.097	
Skewness	3.258	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.571	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0343	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0343	95% Adjusted-CLT UCL (Chen 1995)		0.0399
		95% Modified-t UCL (Johnson-1978)		0.0352

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0569	95% CLT UCL	0.0336
		95% Jackknife UCL	0.0343
		95% Standard Bootstrap UCL	0.0333
		95% Bootstrap-t UCL	0.0647
		95% Hall's Bootstrap UCL	0.104
		95% Percentile Bootstrap UCL	0.035
		95% BCA Bootstrap UCL	0.0409
		95% Chebyshev(Mean, Sd) UCL	0.0569
		97.5% Chebyshev(Mean, Sd) UCL	0.073
		99% Chebyshev(Mean, Sd) UCL	0.105

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	5.97	Minimum of Log Data	1.787
Maximum	32.8	Maximum of Log Data	3.49
Mean	13.68	Mean of log Data	2.543
Median	13.4	SD of log Data	0.373
SD	6.03		
Coefficient of Variation	0.441		
Skewness	2.07E+00		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.764	Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.84	95% H-UCL	15.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.32
95% Adjusted-CLT UCL (Chen-1995)	16.33	97.5% Chebyshev (MVUE) UCL	20.36
95% Modified-t UCL (Johnson-1978)	15.93	99% Chebyshev (MVUE) UCL	24.37

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.17	Data appear Lognormal at 5% Significance Level	
Theta Star	2.217		
MLE of Mean	13.68		
MLE of Standard Deviation	5.506		
nu star	283.8		
Approximate Chi Square Value (.05)	245.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	15.75
Adjusted Chi Square Value	243.2	95% Jackknife UCL	15.84
		95% Standard Bootstrap UCL	15.62
Anderson-Darling Test Statistic	1.057	95% Bootstrap-t UCL	17.61
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	29.46
Kolmogorov-Smirnov Test Statistic	0.233	95% Percentile Bootstrap UCL	15.79
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	16.43
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.16
		97.5% Chebyshev(Mean, Sd) UCL	21.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.19
95% Approximate Gamma UCL	15.79		
95% Adjusted Gamma UCL	15.96		

Potential UCL to Use		
	Use 95% Student's-t UCL	15.84
	or 95% Modified-t UCL	15.93
	or 95% H-UCL	15.83

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	94	Maximum of Log Data	4.543
Mean	39.79	Mean of log Data	3.026
Median	50	SD of log Data	1.794
SD	24.23		
Coefficient of Variation	0.609		
Skewness	-0.323		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.66
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	48.46	95% H-UCL	427
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	269.1
95% Adjusted-CLT UCL (Chen-1995)	47.73	97.5% Chebyshev (MVUE) UCL	347.3
95% Modified-t UCL (Johnson-1978)	48.41	99% Chebyshev (MVUE) UCL	501.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.803	Data do not follow a Discernable Distribution (0.05)	
Theta Star	49.52		
MLE of Mean	39.79		
MLE of Standard Deviation	44.39		
nu star	36.96		
Approximate Chi Square Value (.05)	24.04	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	48.1
Adjusted Chi Square Value	23.28	95% Jackknife UCL	48.46
		95% Standard Bootstrap UCL	48.03
Anderson-Darling Test Statistic	3.45	95% Bootstrap-t UCL	47.96
Anderson-Darling 5% Critical Value	0.775	95% Hall's Bootstrap UCL	48.09
Kolmogorov-Smirnov Test Statistic	0.379	95% Percentile Bootstrap UCL	47.67
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	47.54
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	61.81
		97.5% Chebyshev(Mean, Sd) UCL	71.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	90.06
95% Approximate Gamma UCL	61.16		
95% Adjusted Gamma UCL	63.15		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	61.81

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	22

Raw Statistics		Log-transformed Statistics	
Minimum	1.40E-04	Minimum of Log Data	-8.874
Maximum	7.63	Maximum of Log Data	2.032
Mean	1.305	Mean of log Data	-2.293
Median	0.42	SD of log Data	3.605
SD	2.054		
Coefficient of Variation	1.575		
Skewness	2.135		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.666	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.04	95% H-UCL	12830
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.41
95% Adjusted-CLT UCL (Chen-1995)	2.213	97.5% Chebyshev (MVUE) UCL	116
95% Modified-t UCL (Johnson-1978)	2.072	99% Chebyshev (MVUE) UCL	174.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.267	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	4.888		
MLE of Mean	1.305		
MLE of Standard Deviation	2.525		
nu star	12.28		
Approximate Chi Square Value (.05)	5.41	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	2.009
Adjusted Chi Square Value	5.082	95% Jackknife UCL	2.04
		95% Standard Bootstrap UCL	1.989
Anderson-Darling Test Statistic	0.819	95% Bootstrap-t UCL	2.55
Anderson-Darling 5% Critical Value	0.861	95% Hall's Bootstrap UCL	2.137
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	2.073
Kolmogorov-Smirnov 5% Critical Value	0.198	95% BCA Bootstrap UCL	2.2
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.172
		97.5% Chebyshev(Mean, Sd) UCL	3.979
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.566
95% Approximate Gamma UCL	2.961		
95% Adjusted Gamma UCL	3.152		
Potential UCL to Use		Use 95% Adjusted Gamma UCL	3.152

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	22

Raw Statistics		Log-transformed Statistics	
Minimum	1.5	Minimum of Log Data	0.405
Maximum	20200	Maximum of Log Data	9.913
Mean	4523	Mean of log Data	7.55
Median	3778	SD of log Data	2.075
SD	4508		
Coefficient of Variation	0.997		
Skewness	2.013		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.813	Shapiro Wilk Test Statistic	0.77
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6137	95% H-UCL	103921
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43846
95% Adjusted-CLT UCL (Chen-1995)	6491	97.5% Chebyshev (MVUE) UCL	57253
95% Modified-t UCL (Johnson-1978)	6203	99% Chebyshev (MVUE) UCL	83587

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.635	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	7120		
MLE of Mean	4523		
MLE of Standard Deviation	5675		
nu star	29.22		
Approximate Chi Square Value (.05)	17.88	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	6070
Adjusted Chi Square Value	17.24	95% Jackknife UCL	6137
		95% Standard Bootstrap UCL	6050
Anderson-Darling Test Statistic	0.698	95% Bootstrap-t UCL	6756
Anderson-Darling 5% Critical Value	0.787	95% Hall's Bootstrap UCL	8859
Kolmogorov-Smirnov Test Statistic	0.21	95% Percentile Bootstrap UCL	6110
Kolmogorov-Smirnov 5% Critical Value	0.189	95% BCA Bootstrap UCL	6612
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8621
		97.5% Chebyshev(Mean, Sd) UCL	10394
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13877
95% Approximate Gamma UCL	7392		
95% Adjusted Gamma UCL	7667		

Potential UCL to Use		Use 95% Approximate Gamma UCL	7392

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	1.59	Minimum of Log Data	0.464
Maximum	713	Maximum of Log Data	6.569
Mean	85.67	Mean of log Data	3.467
Median	48	SD of log Data	1.536
SD	149.8		
Coefficient of Variation	1.748		
Skewness	3.67		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	139.3	95% H-UCL	307.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	255.8
95% Adjusted-CLT UCL (Chen-1995)	162.6	97.5% Chebyshev (MVUE) UCL	325.7
95% Modified-t UCL (Johnson-1978)	143.3	99% Chebyshev (MVUE) UCL	462.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.572	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	149.7		
MLE of Mean	85.67		
MLE of Standard Deviation	113.3		
nu star	26.32		
Approximate Chi Square Value (.05)	15.62	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	137
Adjusted Chi Square Value	15.03	95% Jackknife UCL	139.3
		95% Standard Bootstrap UCL	136.6
Anderson-Darling Test Statistic	0.65	95% Bootstrap-t UCL	227.9
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	341
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	137.1
Kolmogorov-Smirnov 5% Critical Value	0.19	95% BCA Bootstrap UCL	172.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	221.8
		97.5% Chebyshev(Mean, Sd) UCL	280.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	396.4
95% Approximate Gamma UCL	144.3		
95% Adjusted Gamma UCL	150		

Potential UCL to Use		Use 95% Approximate Gamma UCL	144.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	0.207	Minimum of Log Data	-1.575
Maximum	65.1	Maximum of Log Data	4.176
Mean	13.54	Mean of log Data	1.664
Median	8.7	SD of log Data	1.624
SD	17.66		
Coefficient of Variation	1.304		
Skewness	1.954		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.722	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.86	95% H-UCL	64.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.61
95% Adjusted-CLT UCL (Chen-1995)	21.19	97.5% Chebyshev (MVUE) UCL	63.48
95% Modified-t UCL (Johnson-1978)	20.11	99% Chebyshev (MVUE) UCL	90.73

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.593	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	22.82		
MLE of Mean	13.54		
MLE of Standard Deviation	17.58		
nu star	27.28		
Approximate Chi Square Value (.05)	16.37	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	19.59
Adjusted Chi Square Value	15.76	95% Jackknife UCL	19.86
		95% Standard Bootstrap UCL	19.39
Anderson-Darling Test Statistic	0.371	95% Bootstrap-t UCL	22.83
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	26.02
Kolmogorov-Smirnov Test Statistic	0.12	95% Percentile Bootstrap UCL	19.87
Kolmogorov-Smirnov 5% Critical Value	0.19	95% BCA Bootstrap UCL	20.78
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29.58
		97.5% Chebyshev(Mean, Sd) UCL	36.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50.17
95% Approximate Gamma UCL	22.56		
95% Adjusted Gamma UCL	23.44		

Potential UCL to Use		Use 95% Approximate Gamma UCL	22.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	14.8	Minimum of Log Data	2.695
Maximum	4540	Maximum of Log Data	8.421
Mean	683.1	Mean of log Data	5.677
Median	438	SD of log Data	1.492
SD	974.3		
Coefficient of Variation	1.426		
Skewness	3.085		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.642	Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1032	95% H-UCL	2486
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2151
95% Adjusted-CLT UCL (Chen-1995)	1157	97.5% Chebyshev (MVUE) UCL	2731
95% Modified-t UCL (Johnson-1978)	1054	99% Chebyshev (MVUE) UCL	3870

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.646	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1057		
MLE of Mean	683.1		
MLE of Standard Deviation	849.8		
nu star	29.72		
Approximate Chi Square Value (.05)	18.28	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	1017
Adjusted Chi Square Value	17.63	95% Jackknife UCL	1032
		95% Standard Bootstrap UCL	1010
Anderson-Darling Test Statistic	0.315	95% Bootstrap-t UCL	1428
Anderson-Darling 5% Critical Value	0.786	95% Hall's Bootstrap UCL	2381
Kolmogorov-Smirnov Test Statistic	0.127	95% Percentile Bootstrap UCL	1031
Kolmogorov-Smirnov 5% Critical Value	0.189	95% BCA Bootstrap UCL	1171
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1569
		97.5% Chebyshev(Mean, Sd) UCL	1952
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2705
95% Approximate Gamma UCL	1111		
95% Adjusted Gamma UCL	1152		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1111

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	17.7	Minimum of Log Data	2.874
Maximum	51.7	Maximum of Log Data	3.945
Mean	32.34	Mean of log Data	3.444
Median	32.34	SD of log Data	0.26
SD	8.477		
Coefficient of Variation	0.262		
Skewness	0.743		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Test Statistic	0.942
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	35.38	95% H-UCL	35.79
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	40.08
95% Adjusted-CLT UCL (Chen-1995)	35.54	97.5% Chebyshev (MVUE) UCL	43.43
95% Modified-t UCL (Johnson-1978)	35.42	99% Chebyshev (MVUE) UCL	50

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.69	Data appear Normal at 5% Significance Level	
Theta Star	2.362		
MLE of Mean	32.34		
MLE of Standard Deviation	8.741		
nu star	629.7		
Approximate Chi Square Value (.05)	572.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	35.25
Adjusted Chi Square Value	568.6	95% Jackknife UCL	35.38
		95% Standard Bootstrap UCL	35.23
Anderson-Darling Test Statistic	0.711	95% Bootstrap-t UCL	35.89
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	35.9
Kolmogorov-Smirnov Test Statistic	0.213	95% Percentile Bootstrap UCL	35.33
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	35.43
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.05
		97.5% Chebyshev(Mean, Sd) UCL	43.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	49.93
95% Approximate Gamma UCL	35.57		
95% Adjusted Gamma UCL	35.82		

Potential UCL to Use		Use 95% Student's-t UCL	35.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	541-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	7240	Minimum of Log Data	8.887
Maximum	19200	Maximum of Log Data	9.863
Mean	13315	Mean of log Data	9.474
Median	13315	SD of log Data	0.223
SD	2719		
Coefficient of Variation	0.204		
Skewness	-0.295		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14288	95% H-UCL	14529
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16067
95% Adjusted-CLT UCL (Chen-1995)	14210	97.5% Chebyshev (MVUE) UCL	17249
95% Modified-t UCL (Johnson-1978)	14282	99% Chebyshev (MVUE) UCL	19570

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.68	Data appear Normal at 5% Significance Level	
Theta Star	676.7		
MLE of Mean	13315		
MLE of Standard Deviation	3002		
nu star	905.1		
Approximate Chi Square Value (.05)	836.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	14247
Adjusted Chi Square Value	831.5	95% Jackknife UCL	14288
		95% Standard Bootstrap UCL	14225
Anderson-Darling Test Statistic	0.678	95% Bootstrap-t UCL	14248
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	14275
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	14200
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	14232
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15786
		97.5% Chebyshev(Mean, Sd) UCL	16855
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18956
95% Approximate Gamma UCL	14411		
95% Adjusted Gamma UCL	14493		

Potential UCL to Use		Use 95% Student's-t UCL	14288

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Americium-241

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics
Minimum	-0.0047	Log Statistics Not Avaliable
Maximum	27.3	
Mean	2.249	
Median	0.0031	
SD	5.812	
Coefficient of Variation	2.584	
Skewness	4.023	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.419	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	4.33	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	4.33	95% Adjusted-CLT UCL (Chen 1995)		5.329
		95% Modified-t UCL (Johnson-1978)		4.5

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	7.532	95% CLT UCL	4.243
		95% Jackknife UCL	4.33
		95% Standard Bootstrap UCL	4.286
		95% Bootstrap-t UCL	10.76
		95% Hall's Bootstrap UCL	12.88
		95% Percentile Bootstrap UCL	4.531
		95% BCA Bootstrap UCL	5.789
		95% Chebyshev(Mean, Sd) UCL	7.532
		97.5% Chebyshev(Mean, Sd) UCL	9.817
		99% Chebyshev(Mean, Sd) UCL	14.31

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	16
Raw Statistics		Log-transformed Statistics	
Minimum	63	Minimum of Log Data	4.143
Maximum	230	Maximum of Log Data	5.438
Mean	114.6	Mean of log Data	4.698
Median	108	SD of log Data	0.292
SD	37.36		
Coefficient of Variation	0.326		
Skewness	1.683		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	128	95% H-UCL	128.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	145.1
95% Adjusted-CLT UCL (Chen-1995)	130.3	97.5% Chebyshev (MVUE) UCL	158.4
95% Modified-t UCL (Johnson-1978)	128.4	99% Chebyshev (MVUE) UCL	184.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.24	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.19		
MLE of Mean	114.6		
MLE of Standard Deviation	35.82		
nu star	471		
Approximate Chi Square Value (.05)	421.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	127.4
Adjusted Chi Square Value	418.3	95% Jackknife UCL	128
		95% Standard Bootstrap UCL	127.1
Anderson-Darling Test Statistic	1.161	95% Bootstrap-t UCL	133.8
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	141.5
Kolmogorov-Smirnov Test Statistic	0.248	95% Percentile Bootstrap UCL	127.3
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	131.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	148.6
		97.5% Chebyshev(Mean, Sd) UCL	163.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	192.1
95% Approximate Gamma UCL	128		
95% Adjusted Gamma UCL	129.1		
Potential UCL to Use		Use 95% Student's-t UCL	128
		or 95% Modified-t UCL	128.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.424	Minimum of Log Data	-0.858
Maximum	1.46	Maximum of Log Data	0.378
Mean	0.608	Mean of log Data	-0.553
Median	0.577	SD of log Data	0.308
SD	0.253		
Coefficient of Variation	0.417		
Skewness	2.724		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.601	Shapiro Wilk Test Statistic	0.744
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.698	95% H-UCL	0.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.773
95% Adjusted-CLT UCL (Chen-1995)	0.727	97.5% Chebyshev (MVUE) UCL	0.847
95% Modified-t UCL (Johnson-1978)	0.703	99% Chebyshev (MVUE) UCL	0.992

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.074	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0753		
MLE of Mean	0.608		
MLE of Standard Deviation	0.214		
nu star	371.4		
Approximate Chi Square Value (.05)	327.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.695
Adjusted Chi Square Value	324.8	95% Jackknife UCL	0.698
		95% Standard Bootstrap UCL	0.692
Anderson-Darling Test Statistic	2.421	95% Bootstrap-t UCL	0.861
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	1.213
Kolmogorov-Smirnov Test Statistic	0.282	95% Percentile Bootstrap UCL	0.698
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.723
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.838
		97.5% Chebyshev(Mean, Sd) UCL	0.938
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.133
95% Approximate Gamma UCL	0.689		
95% Adjusted Gamma UCL	0.695		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.698
		or 95% Modified-t UCL	0.703

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.481	Minimum of Log Data	-0.732
Maximum	2.75	Maximum of Log Data	1.012
Mean	1.374	Mean of log Data	0.174
Median	1.374	SD of log Data	0.564
SD	0.714		
Coefficient of Variation	0.52		
Skewness	0.427		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.629	95% H-UCL	1.783
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.131
95% Adjusted-CLT UCL (Chen-1995)	1.633	97.5% Chebyshev (MVUE) UCL	2.453
95% Modified-t UCL (Johnson-1978)	1.631	99% Chebyshev (MVUE) UCL	3.087

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.209	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.428		
MLE of Mean	1.374		
MLE of Standard Deviation	0.767		
nu star	147.6		
Approximate Chi Square Value (.05)	120.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	1.618
Adjusted Chi Square Value	118.7	95% Jackknife UCL	1.629
		95% Standard Bootstrap UCL	1.611
Anderson-Darling Test Statistic	0.645	95% Bootstrap-t UCL	1.655
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	1.627
Kolmogorov-Smirnov Test Statistic	0.141	95% Percentile Bootstrap UCL	1.614
Kolmogorov-Smirnov 5% Critical Value	0.183	95% BCA Bootstrap UCL	1.619
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.023
		97.5% Chebyshev(Mean, Sd) UCL	2.304
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.855
95% Approximate Gamma UCL	1.682		
95% Adjusted Gamma UCL	1.707		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1.682

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics
Minimum	-0.0236	Log Statistics Not Avaliable
Maximum	2.33	
Mean	0.437	
Median	0.251	
SD	0.573	
Coefficient of Variation	1.31	
Skewness	2.602	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.622	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.642	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.642	95% Adjusted-CLT UCL (Chen 1995)		0.703
		95% Modified-t UCL (Johnson-1978)		0.653

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.958	95% CLT UCL	0.634
		95% Jackknife UCL	0.642
		95% Standard Bootstrap UCL	0.632
		95% Bootstrap-t UCL	0.992
		95% Hall's Bootstrap UCL	1.534
		95% Percentile Bootstrap UCL	0.638
		95% BCA Bootstrap UCL	0.729
		95% Chebyshev(Mean, Sd) UCL	0.958
		97.5% Chebyshev(Mean, Sd) UCL	1.183
		99% Chebyshev(Mean, Sd) UCL	1.625

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	22

Raw Statistics		Log-transformed Statistics	
Minimum	10.8	Minimum of Log Data	2.38
Maximum	3353	Maximum of Log Data	8.117
Mean	532.7	Mean of log Data	5.6
Median	366.5	SD of log Data	1.307
SD	712		
Coefficient of Variation	1.337		
Skewness	3.11		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.647	Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	787.6	95% H-UCL	1449
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1440
95% Adjusted-CLT UCL (Chen-1995)	879.7	97.5% Chebyshev (MVUE) UCL	1804
95% Modified-t UCL (Johnson-1978)	803.7	99% Chebyshev (MVUE) UCL	2521

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.783	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	680.4		
MLE of Mean	532.7		
MLE of Standard Deviation	602.1		
nu star	36.01		
Approximate Chi Square Value (.05)	23.28	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	776.9
Adjusted Chi Square Value	22.54	95% Jackknife UCL	787.6
		95% Standard Bootstrap UCL	767.2
Anderson-Darling Test Statistic	0.259	95% Bootstrap-t UCL	1056
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	1842
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	799.5
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	912
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1180
		97.5% Chebyshev(Mean, Sd) UCL	1460
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2010
95% Approximate Gamma UCL	824.1		
95% Adjusted Gamma UCL	851.2		

Potential UCL to Use		Use 95% Approximate Gamma UCL	824.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics
Minimum	-0.0094	Log Statistics Not Avaliable
Maximum	0.0183	
Mean	0.0063	
Median	0.0063	
SD	0.0042	
Coefficient of Variation	0.677	
Skewness	-1.373	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.465	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0078	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0078	95% Adjusted-CLT UCL (Chen 1995)		0.00744
		95% Modified-t UCL (Johnson-1978)		0.00773

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0101	95% CLT UCL	0.00771
		95% Jackknife UCL	0.00778
		95% Standard Bootstrap UCL	0.00769
		95% Bootstrap-t UCL	0.00746
		95% Hall's Bootstrap UCL	0.00765
		95% Percentile Bootstrap UCL	0.00752
		95% BCA Bootstrap UCL	0.00736
		95% Chebyshev(Mean, Sd) UCL	0.0101
		97.5% Chebyshev(Mean, Sd) UCL	0.0118
		99% Chebyshev(Mean, Sd) UCL	0.0151

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	7080	Minimum of Log Data	8.865
Maximum	29600	Maximum of Log Data	10.3
Mean	14405	Mean of log Data	9.539
Median	14400	SD of log Data	0.269
SD	4364		
Coefficient of Variation	0.303		
Skewness	2.099		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.777	Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15967	95% H-UCL	15967
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17932
95% Adjusted-CLT UCL (Chen-1995)	16327	97.5% Chebyshev (MVUE) UCL	19471
95% Modified-t UCL (Johnson-1978)	16034	99% Chebyshev (MVUE) UCL	22493

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	12.08	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1192		
MLE of Mean	14405		
MLE of Standard Deviation	4144		
nu star	555.7		
Approximate Chi Square Value (.05)	502.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	15902
Adjusted Chi Square Value	498.4	95% Jackknife UCL	15967
		95% Standard Bootstrap UCL	15846
Anderson-Darling Test Statistic	1.284	95% Bootstrap-t UCL	16795
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	25359
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	15978
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	16358
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18371
		97.5% Chebyshev(Mean, Sd) UCL	20088
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23459
95% Approximate Gamma UCL	15945		
95% Adjusted Gamma UCL	16063		

Potential UCL to Use		
	Use 95% Student's-t UCL	15967
	or 95% Modified-t UCL	16034

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.016	Minimum of Log Data	-4.135
Maximum	0.23	Maximum of Log Data	-1.47
Mean	0.0472	Mean of log Data	-3.385
Median	0.027	SD of log Data	0.711
SD	0.0559		
Coefficient of Variation	1.184		
Skewness	2.895		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.517	Shapiro Wilk Test Statistic	0.812
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0673	95% H-UCL	0.0607
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0729
95% Adjusted-CLT UCL (Chen-1995)	0.0739	97.5% Chebyshev (MVUE) UCL	0.0859
95% Modified-t UCL (Johnson-1978)	0.0684	99% Chebyshev (MVUE) UCL	0.111

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.465	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0322		
MLE of Mean	0.0472		
MLE of Standard Deviation	0.039		
nu star	67.38		
Approximate Chi Square Value (.05)	49.49	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.0664
Adjusted Chi Square Value	48.38	95% Jackknife UCL	0.0673
		95% Standard Bootstrap UCL	0.0657
Anderson-Darling Test Statistic	2.356	95% Bootstrap-t UCL	0.125
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	0.179
Kolmogorov-Smirnov Test Statistic	0.292	95% Percentile Bootstrap UCL	0.0675
Kolmogorov-Smirnov 5% Critical Value	0.185	95% BCA Bootstrap UCL	0.0745
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0981
		97.5% Chebyshev(Mean, Sd) UCL	0.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.163
95% Approximate Gamma UCL	0.0643		
95% Adjusted Gamma UCL	0.0658		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0981

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.46	Minimum of Log Data	-0.777
Maximum	1.8	Maximum of Log Data	0.588
Mean	0.557	Mean of log Data	-0.639
Median	0.49	SD of log Data	0.277
SD	0.273		
Coefficient of Variation	0.491		
Skewness	4.655		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.322	Shapiro Wilk Test Statistic	0.431
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.655	95% H-UCL	0.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.687
95% Adjusted-CLT UCL (Chen-1995)	0.71	97.5% Chebyshev (MVUE) UCL	0.748
95% Modified-t UCL (Johnson-1978)	0.664	99% Chebyshev (MVUE) UCL	0.866

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.25	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0675		
MLE of Mean	0.557		
MLE of Standard Deviation	0.194		
nu star	379.5		
Approximate Chi Square Value (.05)	335.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	0.651
Adjusted Chi Square Value	332.4	95% Jackknife UCL	0.655
		95% Standard Bootstrap UCL	0.646
Anderson-Darling Test Statistic	5.108	95% Bootstrap-t UCL	1.09
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	1.017
Kolmogorov-Smirnov Test Statistic	0.413	95% Percentile Bootstrap UCL	0.67
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	0.731
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.806
		97.5% Chebyshev(Mean, Sd) UCL	0.913
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.124
95% Approximate Gamma UCL	0.63		
95% Adjusted Gamma UCL	0.636		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.655
	or 95% Modified-t UCL	0.664

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics
Minimum	-0.0167	Log Statistics Not Avaliable
Maximum	0.181	
Mean	0.0169	
Median	0.0043	
SD	0.0422	
Coefficient of Variation	2.5	
Skewness	3.146	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.603	Not Available
Shapiro Wilk Critical Value	0.914	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.032	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.032	95% Adjusted-CLT UCL (Chen 1995)		0.0375
		95% Modified-t UCL (Johnson-1978)		0.033

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0552	95% CLT UCL	0.0314
		95% Jackknife UCL	0.032
		95% Standard Bootstrap UCL	0.0308
		95% Bootstrap-t UCL	0.0576
		95% Hall's Bootstrap UCL	0.106
		95% Percentile Bootstrap UCL	0.0334
		95% BCA Bootstrap UCL	0.0402
		95% Chebyshev(Mean, Sd) UCL	0.0552
		97.5% Chebyshev(Mean, Sd) UCL	0.0718
		99% Chebyshev(Mean, Sd) UCL	0.104

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	5.97	Minimum of Log Data	1.787
Maximum	32.8	Maximum of Log Data	3.49
Mean	13.03	Mean of log Data	2.488
Median	12.2	SD of log Data	0.387
SD	6.171		
Coefficient of Variation	0.474		
Skewness	2.217		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.738	Shapiro Wilk Test Statistic	0.909
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.24	95% H-UCL	15.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.57
95% Adjusted-CLT UCL (Chen-1995)	15.78	97.5% Chebyshev (MVUE) UCL	19.58
95% Modified-t UCL (Johnson-1978)	15.34	99% Chebyshev (MVUE) UCL	23.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.625	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.316		
MLE of Mean	13.03		
MLE of Standard Deviation	5.493		
nu star	258.8		
Approximate Chi Square Value (.05)	222.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	15.15
Adjusted Chi Square Value	220.1	95% Jackknife UCL	15.24
		95% Standard Bootstrap UCL	15.14
Anderson-Darling Test Statistic	1.167	95% Bootstrap-t UCL	17.15
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	28.44
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	15.24
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	16.09
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.64
		97.5% Chebyshev(Mean, Sd) UCL	21.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25.83
95% Approximate Gamma UCL	15.15		
95% Adjusted Gamma UCL	15.32		

Potential UCL to Use		
	Use 95% Student's-t UCL	15.24
	or 95% Modified-t UCL	15.34

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	94	Maximum of Log Data	4.543
Mean	38.38	Mean of log Data	2.926
Median	50	SD of log Data	1.927
SD	24.46		
Coefficient of Variation	0.637		
Skewness	-0.158		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.841	Shapiro Wilk Test Statistic	0.664
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	47.14	95% H-UCL	600.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	317.1
95% Adjusted-CLT UCL (Chen-1995)	46.59	97.5% Chebyshev (MVUE) UCL	411.7
95% Modified-t UCL (Johnson-1978)	47.11	99% Chebyshev (MVUE) UCL	597.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.742	Data do not follow a Discernable Distribution (0.05)	
Theta Star	51.75		
MLE of Mean	38.38		
MLE of Standard Deviation	44.57		
nu star	34.11		
Approximate Chi Square Value (.05)	21.75	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	46.77
Adjusted Chi Square Value	21.04	95% Jackknife UCL	47.14
		95% Standard Bootstrap UCL	46.53
Anderson-Darling Test Statistic	2.984	95% Bootstrap-t UCL	46.8
Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	46.87
Kolmogorov-Smirnov Test Statistic	0.341	95% Percentile Bootstrap UCL	46.36
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	46.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	60.61
		97.5% Chebyshev(Mean, Sd) UCL	70.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	89.13
95% Approximate Gamma UCL	60.18		
95% Adjusted Gamma UCL	62.23		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	60.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	23	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	######	Minimum of Log Data	-7.07
Maximum	7.63	Maximum of Log Data	2.032
Mean	1.006	Mean of log Data	-2.301
Median	0.23	SD of log Data	3.083
SD	1.907		
Coefficient of Variation	1.897		
Skewness	2.789		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.565	Shapiro Wilk Test Statistic	0.869
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.689	95% H-UCL	564.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.9
95% Adjusted-CLT UCL (Chen-1995)	1.907	97.5% Chebyshev (MVUE) UCL	30.59
95% Modified-t UCL (Johnson-1978)	1.727	99% Chebyshev (MVUE) UCL	45.69

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.289	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3.479		
MLE of Mean	1.006		
MLE of Standard Deviation	1.87		
nu star	13.3		
Approximate Chi Square Value (.05)	6.094	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	1.66
Adjusted Chi Square Value	5.742	95% Jackknife UCL	1.689
		95% Standard Bootstrap UCL	1.633
Anderson-Darling Test Statistic	0.602	95% Bootstrap-t UCL	2.878
Anderson-Darling 5% Critical Value	0.849	95% Hall's Bootstrap UCL	4.626
Kolmogorov-Smirnov Test Statistic	0.145	95% Percentile Bootstrap UCL	1.751
Kolmogorov-Smirnov 5% Critical Value	0.197	95% BCA Bootstrap UCL	1.947
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.739
		97.5% Chebyshev(Mean, Sd) UCL	3.489
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.963
95% Approximate Gamma UCL	2.195		
95% Adjusted Gamma UCL	2.329		

Potential UCL to Use		Use 95% Adjusted Gamma UCL	2.329

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	22

Raw Statistics		Log-transformed Statistics	
Minimum	1.5	Minimum of Log Data	0.405
Maximum	20200	Maximum of Log Data	9.913
Mean	3838	Mean of log Data	7.319
Median	3126	SD of log Data	2.052
SD	4473		
Coefficient of Variation	1.166		
Skewness	2.474		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.742	Shapiro Wilk Test Statistic	0.814
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5440	95% H-UCL	75688
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33158
95% Adjusted-CLT UCL (Chen-1995)	5886	97.5% Chebyshev (MVUE) UCL	43260
95% Modified-t UCL (Johnson-1978)	5520	99% Chebyshev (MVUE) UCL	63103

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.597	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	6424		
MLE of Mean	3838		
MLE of Standard Deviation	4965		
nu star	27.48		
Approximate Chi Square Value (.05)	16.53	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	5372
Adjusted Chi Square Value	15.91	95% Jackknife UCL	5440
		95% Standard Bootstrap UCL	5339
Anderson-Darling Test Statistic	0.412	95% Bootstrap-t UCL	6455
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	13079
Kolmogorov-Smirnov Test Statistic	0.161	95% Percentile Bootstrap UCL	5489
Kolmogorov-Smirnov 5% Critical Value	0.19	95% BCA Bootstrap UCL	5938
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7904
		97.5% Chebyshev(Mean, Sd) UCL	9663
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13119
95% Approximate Gamma UCL	6383		
95% Adjusted Gamma UCL	6629		

Potential UCL to Use		Use 95% Approximate Gamma UCL	6383

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	1.09	Minimum of Log Data	0.0862
Maximum	713	Maximum of Log Data	6.569
Mean	82.25	Mean of log Data	3.298
Median	34.2	SD of log Data	1.673
SD	150.5		
Coefficient of Variation	1.83		
Skewness	3.685		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.524	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	136.1	95% H-UCL	385.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	279.6
95% Adjusted-CLT UCL (Chen-1995)	159.6	97.5% Chebyshev (MVUE) UCL	358.7
95% Modified-t UCL (Johnson-1978)	140.2	99% Chebyshev (MVUE) UCL	514.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.517	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	159		
MLE of Mean	82.25		
MLE of Standard Deviation	114.4		
nu star	23.79		
Approximate Chi Square Value (.05)	13.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	133.9
Adjusted Chi Square Value	13.13	95% Jackknife UCL	136.1
		95% Standard Bootstrap UCL	134.1
Anderson-Darling Test Statistic	0.538	95% Bootstrap-t UCL	240.3
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	335.6
Kolmogorov-Smirnov Test Statistic	0.189	95% Percentile Bootstrap UCL	136.1
Kolmogorov-Smirnov 5% Critical Value	0.191	95% BCA Bootstrap UCL	167.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	219
		97.5% Chebyshev(Mean, Sd) UCL	278.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	394.5
95% Approximate Gamma UCL	142.9		
95% Adjusted Gamma UCL	149		

Potential UCL to Use		Use 95% Approximate Gamma UCL	142.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	0.111	Minimum of Log Data	-2.198
Maximum	65.1	Maximum of Log Data	4.176
Mean	10.28	Mean of log Data	1.292
Median	4.59	SD of log Data	1.698
SD	15.39		
Coefficient of Variation	1.497		
Skewness	2.647		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.647	Shapiro Wilk Test Statistic	0.96
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15.79	95% H-UCL	55.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.41
95% Adjusted-CLT UCL (Chen-1995)	17.45	97.5% Chebyshev (MVUE) UCL	50.63
95% Modified-t UCL (Johnson-1978)	16.09	99% Chebyshev (MVUE) UCL	72.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.547	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	18.8		
MLE of Mean	10.28		
MLE of Standard Deviation	13.9		
nu star	25.16		
Approximate Chi Square Value (.05)	14.74	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	15.56
Adjusted Chi Square Value	14.16	95% Jackknife UCL	15.79
		95% Standard Bootstrap UCL	15.51
Anderson-Darling Test Statistic	0.385	95% Bootstrap-t UCL	22.01
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	40.54
Kolmogorov-Smirnov Test Statistic	0.157	95% Percentile Bootstrap UCL	15.96
Kolmogorov-Smirnov 5% Critical Value	0.191	95% BCA Bootstrap UCL	18
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24.27
		97.5% Chebyshev(Mean, Sd) UCL	30.33
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.22
95% Approximate Gamma UCL	17.56		
95% Adjusted Gamma UCL	18.27		

Potential UCL to Use		Use 95% Approximate Gamma UCL	17.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	8.93	Minimum of Log Data	2.189
Maximum	4540	Maximum of Log Data	8.421
Mean	595.9	Mean of log Data	5.418
Median	350	SD of log Data	1.62
SD	957.9		
Coefficient of Variation	1.607		
Skewness	3.478		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.577	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	938.9	95% H-UCL	2743
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2105
95% Adjusted-CLT UCL (Chen-1995)	1079	97.5% Chebyshev (MVUE) UCL	2693
95% Modified-t UCL (Johnson-1978)	963.1	99% Chebyshev (MVUE) UCL	3847

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.577	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1032		
MLE of Mean	595.9		
MLE of Standard Deviation	784.2		
nu star	26.56		
Approximate Chi Square Value (.05)	15.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	924.5
Adjusted Chi Square Value	15.21	95% Jackknife UCL	938.9
		95% Standard Bootstrap UCL	915.8
Anderson-Darling Test Statistic	0.366	95% Bootstrap-t UCL	1421
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	2269
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	947.7
Kolmogorov-Smirnov 5% Critical Value	0.19	95% BCA Bootstrap UCL	1145
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1467
		97.5% Chebyshev(Mean, Sd) UCL	1843
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2583
95% Approximate Gamma UCL	1001		
95% Adjusted Gamma UCL	1041		

Potential UCL to Use		Use 95% Approximate Gamma UCL	1001

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	23	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	12.5	Minimum of Log Data	2.526
Maximum	49.7	Maximum of Log Data	3.906
Mean	27.62	Mean of log Data	3.281
Median	27.62	SD of log Data	0.28
SD	7.888		
Coefficient of Variation	0.286		
Skewness	1.235		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.914	Shapiro Wilk Critical Value	0.914
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	30.44	95% H-UCL	30.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.74
95% Adjusted-CLT UCL (Chen-1995)	30.78	97.5% Chebyshev (MVUE) UCL	37.82
95% Modified-t UCL (Johnson-1978)	30.51	99% Chebyshev (MVUE) UCL	43.86

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.92	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.317		
MLE of Mean	27.62		
MLE of Standard Deviation	7.999		
nu star	548.3		
Approximate Chi Square Value (.05)	495	Nonparametric Statistics	
Adjusted Level of Significance	0.0389	95% CLT UCL	30.32
Adjusted Chi Square Value	491.3	95% Jackknife UCL	30.44
		95% Standard Bootstrap UCL	30.29
Anderson-Darling Test Statistic	1.011	95% Bootstrap-t UCL	31.25
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	33.55
Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	30.27
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	30.58
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.79
		97.5% Chebyshev(Mean, Sd) UCL	37.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.98
95% Approximate Gamma UCL	30.59		
95% Adjusted Gamma UCL	30.82		

Potential UCL to Use		
	Use 95% Student's-t UCL	30.44
	or 95% Modified-t UCL	30.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	561-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	7500	Minimum of Log Data	8.923
Maximum	17600	Maximum of Log Data	9.776
Mean	11495	Mean of log Data	9.336
Median	11495	SD of log Data	0.165
SD	1998		
Coefficient of Variation	0.174		
Skewness	1.312		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12094	95% H-UCL	12099
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12957
95% Adjusted-CLT UCL (Chen-1995)	12164	97.5% Chebyshev (MVUE) UCL	13591
95% Modified-t UCL (Johnson-1978)	12108	99% Chebyshev (MVUE) UCL	14837

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	33.71	Data do not follow a Discernable Distribution (0.05)	
Theta Star	341		
MLE of Mean	11495		
MLE of Standard Deviation	1980		
nu star	2158		
Approximate Chi Square Value (.05)	2051	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	12076
Adjusted Chi Square Value	2045	95% Jackknife UCL	12094
		95% Standard Bootstrap UCL	12082
Anderson-Darling Test Statistic	1.928	95% Bootstrap-t UCL	12268
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	12409
Kolmogorov-Smirnov Test Statistic	0.259	95% Percentile Bootstrap UCL	12142
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	12167
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13035
		97.5% Chebyshev(Mean, Sd) UCL	13701
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15010
95% Approximate Gamma UCL	12095		
95% Adjusted Gamma UCL	12127		

Potential UCL to Use		
	Use 95% Student's-t UCL	12094
	or 95% Modified-t UCL	12108

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	3.5	Maximum of Log Data	1.253
Mean	0.45	Mean of log Data	-1.071
Median	0.41	SD of log Data	0.625
SD	0.578		
Coefficient of Variation	1.284		
Skewness	5.033		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.397	Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.623	95% H-UCL	0.523
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.626
95% Adjusted-CLT UCL (Chen-1995)	0.715	97.5% Chebyshev (MVUE) UCL	0.718
95% Modified-t UCL (Johnson-1978)	0.638	99% Chebyshev (MVUE) UCL	0.899

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.82	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.247		
MLE of Mean	0.45		
MLE of Standard Deviation	0.334		
nu star	116.5		
Approximate Chi Square Value (.05)	92.56	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.618
Adjusted Chi Square Value	91.41	95% Jackknife UCL	0.623
		95% Standard Bootstrap UCL	0.617
Anderson-Darling Test Statistic	2.551	95% Bootstrap-t UCL	0.994
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	1.33
Kolmogorov-Smirnov Test Statistic	0.312	95% Percentile Bootstrap UCL	0.648
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.75
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.895
		97.5% Chebyshev(Mean, Sd) UCL	1.088
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.466
95% Approximate Gamma UCL	0.566		
95% Adjusted Gamma UCL	0.573		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.895

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	7.5	Minimum of Log Data	2.015
Maximum	33.1	Maximum of Log Data	3.5
Mean	14.74	Mean of log Data	2.631
Median	14.74	SD of log Data	0.352
SD	5.329		
Coefficient of Variation	0.362		
Skewness	1.239		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.866	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.34	95% H-UCL	16.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.84
95% Adjusted-CLT UCL (Chen-1995)	16.51	97.5% Chebyshev (MVUE) UCL	20.61
95% Modified-t UCL (Johnson-1978)	16.37	99% Chebyshev (MVUE) UCL	24.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.741	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.904		
MLE of Mean	14.74		
MLE of Standard Deviation	5.299		
nu star	495.4		
Approximate Chi Square Value (.05)	444.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	16.29
Adjusted Chi Square Value	442.2	95% Jackknife UCL	16.34
		95% Standard Bootstrap UCL	16.32
Anderson-Darling Test Statistic	1.426	95% Bootstrap-t UCL	16.62
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	17.03
Kolmogorov-Smirnov Test Statistic	0.264	95% Percentile Bootstrap UCL	16.35
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	16.49
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.85
		97.5% Chebyshev(Mean, Sd) UCL	20.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.12
95% Approximate Gamma UCL	16.42		
95% Adjusted Gamma UCL	16.51		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.34
	or 95% Modified-t UCL	16.37

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	82.6	Minimum of Log Data	4.414
Maximum	438	Maximum of Log Data	6.082
Mean	126	Mean of log Data	4.787
Median	123.5	SD of log Data	0.271
SD	58.78		
Coefficient of Variation	0.466		
Skewness	5.098		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.395	Shapiro Wilk Test Statistic	0.631
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	143.7	95% H-UCL	135.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	150.5
95% Adjusted-CLT UCL (Chen-1995)	153.1	97.5% Chebyshev (MVUE) UCL	161.9
95% Modified-t UCL (Johnson-1978)	145.2	99% Chebyshev (MVUE) UCL	184.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.257	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.61		
MLE of Mean	126		
MLE of Standard Deviation	41.42		
nu star	592.5		
Approximate Chi Square Value (.05)	537	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	143.1
Adjusted Chi Square Value	534.2	95% Jackknife UCL	143.7
		95% Standard Bootstrap UCL	142.7
Anderson-Darling Test Statistic	4.242	95% Bootstrap-t UCL	177.6
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	216.1
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	146.4
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	156.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	171.3
		97.5% Chebyshev(Mean, Sd) UCL	190.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	229.4
95% Approximate Gamma UCL	139.1		
95% Adjusted Gamma UCL	139.8		

Potential UCL to Use		
	Use 95% Student's-t UCL	143.7
	or 95% Modified-t UCL	145.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	0.42	Minimum of Log Data	-0.868
Maximum	1.5	Maximum of Log Data	0.405
Mean	0.619	Mean of log Data	-0.508
Median	0.619	SD of log Data	0.227
SD	0.183		
Coefficient of Variation	0.296		
Skewness	3.699		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.608	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.674	95% H-UCL	0.663
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.726
95% Adjusted-CLT UCL (Chen-1995)	0.695	97.5% Chebyshev (MVUE) UCL	0.773
95% Modified-t UCL (Johnson-1978)	0.678	99% Chebyshev (MVUE) UCL	0.866

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0393		
MLE of Mean	0.619		
MLE of Standard Deviation	0.156		
nu star	1010		
Approximate Chi Square Value (.05)	937	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.673
Adjusted Chi Square Value	933.2	95% Jackknife UCL	0.674
		95% Standard Bootstrap UCL	0.672
Anderson-Darling Test Statistic	2.497	95% Bootstrap-t UCL	0.722
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.928
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	0.676
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	0.699
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.761
		97.5% Chebyshev(Mean, Sd) UCL	0.822
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.941
95% Approximate Gamma UCL	0.668		
95% Adjusted Gamma UCL	0.67		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.674
	or 95% Modified-t UCL	0.678

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics
Minimum	-0.006	Log Statistics Not Avaliable
Maximum	0.391	
Mean	0.177	
Median	0.177	
SD	0.099	
Coefficient of Variation	0.56	
Skewness	0.447	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.902	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.206	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.206	95% Adjusted-CLT UCL (Chen 1995)		0.207
		95% Modified-t UCL (Johnson-1978)		0.207

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.253	95% CLT UCL	0.206
		95% Jackknife UCL	0.206
		95% Standard Bootstrap UCL	0.204
		95% Bootstrap-t UCL	0.209
		95% Hall's Bootstrap UCL	0.21
		95% Percentile Bootstrap UCL	0.206
		95% BCA Bootstrap UCL	0.205
		95% Chebyshev(Mean, Sd) UCL	0.253
		97.5% Chebyshev(Mean, Sd) UCL	0.286
		99% Chebyshev(Mean, Sd) UCL	0.351

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	32

Raw Statistics		Log-transformed Statistics
Minimum	-89.55	Log Statistics Not Avaliable
Maximum	432	
Mean	15.11	
Median	15.36	
SD	97.15	
Coefficient of Variation	6.427	
Skewness	2.648	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.751	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	44.23	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	44.23	95% Adjusted-CLT UCL (Chen 1995)		51.95
		95% Modified-t UCL (Johnson-1978)		45.57

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	89.97	95% CLT UCL	43.36
		95% Jackknife UCL	44.23
		95% Standard Bootstrap UCL	42.57
		95% Bootstrap-t UCL	58.91
		95% Hall's Bootstrap UCL	177.5
		95% Percentile Bootstrap UCL	44.69
		95% BCA Bootstrap UCL	54.74
		95% Chebyshev(Mean, Sd) UCL	89.97
		97.5% Chebyshev(Mean, Sd) UCL	122.4
		99% Chebyshev(Mean, Sd) UCL	186

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	30.9	Maximum of Log Data	3.431
Mean	9.611	Mean of log Data	2.189
Median	9.611	SD of log Data	0.355
SD	4.741		
Coefficient of Variation	0.493		
Skewness	3.309		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.626	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.03	95% H-UCL	10.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.14
95% Adjusted-CLT UCL (Chen-1995)	11.51	97.5% Chebyshev (MVUE) UCL	13.29
95% Modified-t UCL (Johnson-1978)	11.11	99% Chebyshev (MVUE) UCL	15.55

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.345	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.515		
MLE of Mean	9.611		
MLE of Standard Deviation	3.815		
nu star	406.1		
Approximate Chi Square Value (.05)	360.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	10.99
Adjusted Chi Square Value	358	95% Jackknife UCL	11.03
		95% Standard Bootstrap UCL	10.97
Anderson-Darling Test Statistic	2.392	95% Bootstrap-t UCL	12.58
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	17.16
Kolmogorov-Smirnov Test Statistic	0.325	95% Percentile Bootstrap UCL	11.07
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	11.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.26
		97.5% Chebyshev(Mean, Sd) UCL	14.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.95
95% Approximate Gamma UCL	10.83		
95% Adjusted Gamma UCL	10.9		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.03
	or 95% Modified-t UCL	11.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics
Minimum	0	Log Statistics Not Avaliable
Maximum	0.297	
Mean	0.0314	
Median	0.0294	
SD	0.0498	
Coefficient of Variation	1.588	
Skewness	5.172	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.368	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0463	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0463	95% Adjusted-CLT UCL (Chen 1995)		0.0545
		95% Modified-t UCL (Johnson-1978)		0.0476

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0698	95% CLT UCL	0.0459
		95% Jackknife UCL	0.0463
		95% Standard Bootstrap UCL	0.0458
		95% Bootstrap-t UCL	0.0762
		95% Hall's Bootstrap UCL	0.108
		95% Percentile Bootstrap UCL	0.0484
		95% BCA Bootstrap UCL	0.0573
		95% Chebyshev(Mean, Sd) UCL	0.0698
		97.5% Chebyshev(Mean, Sd) UCL	0.0864
		99% Chebyshev(Mean, Sd) UCL	0.119

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	19

Raw Statistics		Log-transformed Statistics	
Minimum	12500	Minimum of Log Data	9.433
Maximum	48500	Maximum of Log Data	10.79
Mean	18926	Mean of log Data	9.817
Median	18926	SD of log Data	0.232
SD	6038		
Coefficient of Variation	0.319		
Skewness	3.995		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.565	Shapiro Wilk Test Statistic	0.76
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20736	95% H-UCL	20275
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22229
95% Adjusted-CLT UCL (Chen-1995)	21487	97.5% Chebyshev (MVUE) UCL	23702
95% Modified-t UCL (Johnson-1978)	20862	99% Chebyshev (MVUE) UCL	26596

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	14.53	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1303		
MLE of Mean	18926		
MLE of Standard Deviation	4966		
nu star	929.8		
Approximate Chi Square Value (.05)	860	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	20682
Adjusted Chi Square Value	856.4	95% Jackknife UCL	20736
		95% Standard Bootstrap UCL	20663
Anderson-Darling Test Statistic	2.966	95% Bootstrap-t UCL	22517
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	29106
Kolmogorov-Smirnov Test Statistic	0.311	95% Percentile Bootstrap UCL	20895
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	21523
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23579
		97.5% Chebyshev(Mean, Sd) UCL	25592
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29546
95% Approximate Gamma UCL	20462		
95% Adjusted Gamma UCL	20547		

Potential UCL to Use		
	Use 95% Student's-t UCL	20736
	or 95% Modified-t UCL	20862

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	364	Minimum of Log Data	5.897
Maximum	5230	Maximum of Log Data	8.562
Mean	1117	Mean of log Data	6.841
Median	1117	SD of log Data	0.554
SD	896.3		
Coefficient of Variation	0.802		
Skewness	3.452		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1386	95% H-UCL	1327
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1572
95% Adjusted-CLT UCL (Chen-1995)	1481	97.5% Chebyshev (MVUE) UCL	1783
95% Modified-t UCL (Johnson-1978)	1402	99% Chebyshev (MVUE) UCL	2198

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.711	Data do not follow a Discernable Distribution (0.05)	
Theta Star	412.2		
MLE of Mean	1117		
MLE of Standard Deviation	678.6		
nu star	173.5		
Approximate Chi Square Value (.05)	144	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	1378
Adjusted Chi Square Value	142.6	95% Jackknife UCL	1386
		95% Standard Bootstrap UCL	1377
Anderson-Darling Test Statistic	1.757	95% Bootstrap-t UCL	1649
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	2567
Kolmogorov-Smirnov Test Statistic	0.267	95% Percentile Bootstrap UCL	1409
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	1517
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1808
		97.5% Chebyshev(Mean, Sd) UCL	2107
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2694
95% Approximate Gamma UCL	1346		
95% Adjusted Gamma UCL	1359		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1808

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics
Minimum	-0.0056	Log Statistics Not Avaliable
Maximum	0.139	
Mean	0.00719	
Median	0.00627	
SD	0.0245	
Coefficient of Variation	3.409	
Skewness	5.32	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.332	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0145	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0145	95% Adjusted-CLT UCL (Chen 1995)		0.0187
		95% Modified-t UCL (Johnson-1978)		0.0152

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0261	95% CLT UCL	0.0143
		95% Jackknife UCL	0.0145
		95% Standard Bootstrap UCL	0.014
		95% Bootstrap-t UCL	0.0333
		95% Hall's Bootstrap UCL	0.0446
		95% Percentile Bootstrap UCL	0.0158
		95% BCA Bootstrap UCL	0.0203
		95% Chebyshev(Mean, Sd) UCL	0.0261
		97.5% Chebyshev(Mean, Sd) UCL	0.0343
		99% Chebyshev(Mean, Sd) UCL	0.0503

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	8.3	Minimum of Log Data	2.116
Maximum	22.8	Maximum of Log Data	3.127
Mean	14.01	Mean of log Data	2.618
Median	14.01	SD of log Data	0.208
SD	3.071		
Coefficient of Variation	0.219		
Skewness	1.226		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.814	Shapiro Wilk Test Statistic	0.866
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.93	95% H-UCL	14.96
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.27
95% Adjusted-CLT UCL (Chen-1995)	15.03	97.5% Chebyshev (MVUE) UCL	17.24
95% Modified-t UCL (Johnson-1978)	14.95	99% Chebyshev (MVUE) UCL	19.17

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	21.29	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.658		
MLE of Mean	14.01		
MLE of Standard Deviation	3.037		
nu star	1362		
Approximate Chi Square Value (.05)	1278	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	14.9
Adjusted Chi Square Value	1273	95% Jackknife UCL	14.93
		95% Standard Bootstrap UCL	14.88
Anderson-Darling Test Statistic	2.414	95% Bootstrap-t UCL	15.06
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	15.27
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	14.91
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.38
		97.5% Chebyshev(Mean, Sd) UCL	17.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.41
95% Approximate Gamma UCL	14.94		
95% Adjusted Gamma UCL	14.99		

Potential UCL to Use		
	Use 95% Student's-t UCL	14.93
	or 95% Modified-t UCL	14.95

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.04	Minimum of Log Data	-3.219
Maximum	2.2	Maximum of Log Data	0.788
Mean	0.636	Mean of log Data	-0.875
Median	0.43	SD of log Data	1.118
SD	0.482		
Coefficient of Variation	0.757		
Skewness	0.981		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.849	Shapiro Wilk Test Statistic	0.838
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.781	95% H-UCL	1.305
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.523
95% Adjusted-CLT UCL (Chen-1995)	0.792	97.5% Chebyshev (MVUE) UCL	1.856
95% Modified-t UCL (Johnson-1978)	0.783	99% Chebyshev (MVUE) UCL	2.509

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.219	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.522		
MLE of Mean	0.636		
MLE of Standard Deviation	0.576		
nu star	78.02		
Approximate Chi Square Value (.05)	58.67	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.777
Adjusted Chi Square Value	57.77	95% Jackknife UCL	0.781
		95% Standard Bootstrap UCL	0.775
Anderson-Darling Test Statistic	1.51	95% Bootstrap-t UCL	0.797
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	0.811
Kolmogorov-Smirnov Test Statistic	0.238	95% Percentile Bootstrap UCL	0.782
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	0.802
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.008
		97.5% Chebyshev(Mean, Sd) UCL	1.168
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.484
95% Approximate Gamma UCL	0.846		
95% Adjusted Gamma UCL	0.86		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.008

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	0.52	Maximum of Log Data	-0.654
Mean	0.299	Mean of log Data	-1.254
Median	0.299	SD of log Data	0.311
SD	0.0949		
Coefficient of Variation	0.317		
Skewness	0.932		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Test Statistic	0.893
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.327	95% H-UCL	0.331
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.372
95% Adjusted-CLT UCL (Chen-1995)	0.329	97.5% Chebyshev (MVUE) UCL	0.404
95% Modified-t UCL (Johnson-1978)	0.328	99% Chebyshev (MVUE) UCL	0.466

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.855	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0303		
MLE of Mean	0.299		
MLE of Standard Deviation	0.0952		
nu star	630.7		
Approximate Chi Square Value (.05)	573.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.327
Adjusted Chi Square Value	570.5	95% Jackknife UCL	0.327
		95% Standard Bootstrap UCL	0.326
Anderson-Darling Test Statistic	1.894	95% Bootstrap-t UCL	0.33
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.332
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	0.326
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	0.329
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.372
		97.5% Chebyshev(Mean, Sd) UCL	0.404
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.466
95% Approximate Gamma UCL	0.329		
95% Adjusted Gamma UCL	0.33		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.327
	or 95% Modified-t UCL	0.328

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	0.00384	Minimum of Log Data	-5.562
Maximum	2.626	Maximum of Log Data	0.965
Mean	0.463	Mean of log Data	-1.032
Median	0.425	SD of log Data	0.968
SD	0.41		
Coefficient of Variation	0.885		
Skewness	4.959		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.371	Shapiro Wilk Test Statistic	0.497
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.586	95% H-UCL	0.862
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.033
95% Adjusted-CLT UCL (Chen-1995)	0.65	97.5% Chebyshev (MVUE) UCL	1.239
95% Modified-t UCL (Johnson-1978)	0.597	99% Chebyshev (MVUE) UCL	1.643
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.883	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.246		
MLE of Mean	0.463		
MLE of Standard Deviation	0.338		
nu star	120.5		
Approximate Chi Square Value (.05)	96.19	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.582
Adjusted Chi Square Value	95.02	95% Jackknife UCL	0.586
		95% Standard Bootstrap UCL	0.578
Anderson-Darling Test Statistic	6.017	95% Bootstrap-t UCL	0.773
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	1.146
Kolmogorov-Smirnov Test Statistic	0.378	95% Percentile Bootstrap UCL	0.602
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.671
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.779
		97.5% Chebyshev(Mean, Sd) UCL	0.916
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.184
95% Approximate Gamma UCL	0.581		
95% Adjusted Gamma UCL	0.588		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.779

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	30

Raw Statistics		Log-transformed Statistics
Minimum	-14.96	Log Statistics Not Avaliable
Maximum	1370	
Mean	68.55	
Median	1.9	
SD	254.3	
Coefficient of Variation	3.709	
Skewness	4.712	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.325	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	144.8	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	144.8	95% Adjusted-CLT UCL (Chen 1995)		182.5
		95% Modified-t UCL (Johnson-1978)		151

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	264.5	95% CLT UCL	142.5
		95% Jackknife UCL	144.8
		95% Standard Bootstrap UCL	140.9
		95% Bootstrap-t UCL	329.4
		95% Hall's Bootstrap UCL	356
		95% Percentile Bootstrap UCL	153.9
		95% BCA Bootstrap UCL	202.1
		95% Chebyshev(Mean, Sd) UCL	264.5
		97.5% Chebyshev(Mean, Sd) UCL	349.3
		99% Chebyshev(Mean, Sd) UCL	515.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	0.128	Minimum of Log Data	-2.056
Maximum	37.78	Maximum of Log Data	3.632
Mean	3.19	Mean of log Data	0.14
Median	1.095	SD of log Data	1.42
SD	6.86		
Coefficient of Variation	2.15		
Skewness	4.54		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.41	Shapiro Wilk Test Statistic	0.899
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.246	95% H-UCL	6.733
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.048
95% Adjusted-CLT UCL (Chen-1995)	6.225	97.5% Chebyshev (MVUE) UCL	8.812
95% Modified-t UCL (Johnson-1978)	5.409	99% Chebyshev (MVUE) UCL	12.28

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.569	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.607		
MLE of Mean	3.19		
MLE of Standard Deviation	4.229		
nu star	36.42		
Approximate Chi Square Value (.05)	23.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	5.185
Adjusted Chi Square Value	23.05	95% Jackknife UCL	5.246
		95% Standard Bootstrap UCL	5.143
Anderson-Darling Test Statistic	1.99	95% Bootstrap-t UCL	11.19
Anderson-Darling 5% Critical Value	0.801	95% Hall's Bootstrap UCL	14.78
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	5.258
Kolmogorov-Smirnov 5% Critical Value	0.163	95% BCA Bootstrap UCL	6.744
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.476
		97.5% Chebyshev(Mean, Sd) UCL	10.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.26
95% Approximate Gamma UCL	4.922		
95% Adjusted Gamma UCL	5.04		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.476

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	0.00686	Minimum of Log Data	-4.982
Maximum	6.788	Maximum of Log Data	1.915
Mean	0.493	Mean of log Data	-2.155
Median	0.0855	SD of log Data	1.781
SD	1.213		
Coefficient of Variation	2.461		
Skewness	4.848		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.377	Shapiro Wilk Test Statistic	0.867
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.856	95% H-UCL	1.734
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.424
95% Adjusted-CLT UCL (Chen-1995)	1.042	97.5% Chebyshev (MVUE) UCL	1.822
95% Modified-t UCL (Johnson-1978)	0.887	99% Chebyshev (MVUE) UCL	2.604

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.426	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.158		
MLE of Mean	0.493		
MLE of Standard Deviation	0.755		
nu star	27.23		
Approximate Chi Square Value (.05)	16.33	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.846
Adjusted Chi Square Value	15.88	95% Jackknife UCL	0.856
		95% Standard Bootstrap UCL	0.849
Anderson-Darling Test Statistic	2.365	95% Bootstrap-t UCL	1.93
Anderson-Darling 5% Critical Value	0.822	95% Hall's Bootstrap UCL	2.434
Kolmogorov-Smirnov Test Statistic	0.245	95% Percentile Bootstrap UCL	0.878
Kolmogorov-Smirnov 5% Critical Value	0.166	95% BCA Bootstrap UCL	1.143
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.427
		97.5% Chebyshev(Mean, Sd) UCL	1.832
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.626
95% Approximate Gamma UCL	0.822		
95% Adjusted Gamma UCL	0.845		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.427

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	0.155	Minimum of Log Data	-1.864
Maximum	412.7	Maximum of Log Data	6.023
Mean	29.71	Mean of log Data	1.404
Median	5.895	SD of log Data	2.365
SD	74.28		
Coefficient of Variation	2.5		
Skewness	4.772		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.383	Shapiro Wilk Test Statistic	0.858
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	51.97	95% H-UCL	432
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	179.6
95% Adjusted-CLT UCL (Chen-1995)	63.15	97.5% Chebyshev (MVUE) UCL	235.3
95% Modified-t UCL (Johnson-1978)	53.82	99% Chebyshev (MVUE) UCL	344.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.329	Data do not follow a Discernable Distribution (0.05)	
Theta Star	90.34		
MLE of Mean	29.71		
MLE of Standard Deviation	51.81		
nu star	21.05		
Approximate Chi Square Value (.05)	11.63	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	51.31
Adjusted Chi Square Value	11.25	95% Jackknife UCL	51.97
		95% Standard Bootstrap UCL	51.65
Anderson-Darling Test Statistic	2.056	95% Bootstrap-t UCL	117.7
Anderson-Darling 5% Critical Value	0.846	95% Hall's Bootstrap UCL	149.9
Kolmogorov-Smirnov Test Statistic	0.222	95% Percentile Bootstrap UCL	52.28
Kolmogorov-Smirnov 5% Critical Value	0.168	95% BCA Bootstrap UCL	70.06
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.95
		97.5% Chebyshev(Mean, Sd) UCL	111.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	160.4
95% Approximate Gamma UCL	53.78		
95% Adjusted Gamma UCL	55.57		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	111.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	20

Raw Statistics		Log-transformed Statistics	
Minimum	23.2	Minimum of Log Data	3.144
Maximum	86.9	Maximum of Log Data	4.465
Mean	36.01	Mean of log Data	3.55
Median	36.01	SD of log Data	0.245
SD	11.31		
Coefficient of Variation	0.314		
Skewness	3.221		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.632	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	39.39	95% H-UCL	38.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	42.7
95% Adjusted-CLT UCL (Chen-1995)	40.51	97.5% Chebyshev (MVUE) UCL	45.66
95% Modified-t UCL (Johnson-1978)	39.58	99% Chebyshev (MVUE) UCL	51.49

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.65	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.638		
MLE of Mean	36.01		
MLE of Standard Deviation	9.746		
nu star	873.5		
Approximate Chi Square Value (.05)	805.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	39.29
Adjusted Chi Square Value	802.5	95% Jackknife UCL	39.39
		95% Standard Bootstrap UCL	39.27
Anderson-Darling Test Statistic	2.991	95% Bootstrap-t UCL	42.58
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	55.8
Kolmogorov-Smirnov Test Statistic	0.341	95% Percentile Bootstrap UCL	39.4
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	41.05
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	44.72
		97.5% Chebyshev(Mean, Sd) UCL	48.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	55.89
95% Approximate Gamma UCL	39.03		
95% Adjusted Gamma UCL	39.19		

Potential UCL to Use		
	Use 95% Student's-t UCL	39.39
	or 95% Modified-t UCL	39.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	561-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	6360	Minimum of Log Data	8.758
Maximum	12500	Maximum of Log Data	9.433
Mean	8481	Mean of log Data	9.036
Median	8481	SD of log Data	0.136
SD	1255		
Coefficient of Variation	0.148		
Skewness	1.838		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.711	Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8863	95% H-UCL	8850
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9386
95% Adjusted-CLT UCL (Chen-1995)	8931	97.5% Chebyshev (MVUE) UCL	9779
95% Modified-t UCL (Johnson-1978)	8876	99% Chebyshev (MVUE) UCL	10551

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	47.96	Data do not follow a Discernable Distribution (0.05)	
Theta Star	176.8		
MLE of Mean	8481		
MLE of Standard Deviation	1225		
nu star	2973		
Approximate Chi Square Value (.05)	2848	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	8852
Adjusted Chi Square Value	2841	95% Jackknife UCL	8863
		95% Standard Bootstrap UCL	8839
Anderson-Darling Test Statistic	3.445	95% Bootstrap-t UCL	9050
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	9819
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	8856
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	8955
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9464
		97.5% Chebyshev(Mean, Sd) UCL	9889
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10724
95% Approximate Gamma UCL	8855		
95% Adjusted Gamma UCL	8876		

Potential UCL to Use		
	Use 95% Student's-t UCL	8863
	or 95% Modified-t UCL	8876

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	22	Maximum of Log Data	3.091
Mean	2.072	Mean of log Data	-0.102
Median	2.072	SD of log Data	1.367
SD	3.852		
Coefficient of Variation	1.859		
Skewness	4.891		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.401	Shapiro Wilk Test Statistic	0.824
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.246	95% H-UCL	4.735
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.065
95% Adjusted-CLT UCL (Chen-1995)	3.859	97.5% Chebyshev (MVUE) UCL	6.314
95% Modified-t UCL (Johnson-1978)	3.347	99% Chebyshev (MVUE) UCL	8.768

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.675	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.067		
MLE of Mean	2.072		
MLE of Standard Deviation	2.521		
nu star	41.88		
Approximate Chi Square Value (.05)	28.05	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	3.21
Adjusted Chi Square Value	27.42	95% Jackknife UCL	3.246
		95% Standard Bootstrap UCL	3.183
Anderson-Darling Test Statistic	2.451	95% Bootstrap-t UCL	5.414
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	7.952
Kolmogorov-Smirnov Test Statistic	0.249	95% Percentile Bootstrap UCL	3.391
Kolmogorov-Smirnov 5% Critical Value	0.164	95% BCA Bootstrap UCL	4.023
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.088
		97.5% Chebyshev(Mean, Sd) UCL	6.392
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.956
95% Approximate Gamma UCL	3.094		
95% Adjusted Gamma UCL	3.165		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.088

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	39.6	Maximum of Log Data	3.679
Mean	10.75	Mean of log Data	2.272
Median	10.75	SD of log Data	0.427
SD	6.322		
Coefficient of Variation	0.588		
Skewness	3.457		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.601	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.68	95% H-UCL	12.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.25
95% Adjusted-CLT UCL (Chen-1995)	13.37	97.5% Chebyshev (MVUE) UCL	15.84
95% Modified-t UCL (Johnson-1978)	12.79	99% Chebyshev (MVUE) UCL	18.95

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.552	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.362		
MLE of Mean	10.75		
MLE of Standard Deviation	5.039		
nu star	282.2		
Approximate Chi Square Value (.05)	244.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	12.62
Adjusted Chi Square Value	242.4	95% Jackknife UCL	12.68
		95% Standard Bootstrap UCL	12.55
Anderson-Darling Test Statistic	2.502	95% Bootstrap-t UCL	14.6
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	22.32
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	12.65
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	13.53
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.7
		97.5% Chebyshev(Mean, Sd) UCL	17.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.05
95% Approximate Gamma UCL	12.42		
95% Adjusted Gamma UCL	12.52		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.68
	or 95% Modified-t UCL	12.79

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	1	Maximum of Log Data	0
Mean	0.577	Mean of log Data	-0.579
Median	0.577	SD of log Data	0.245
SD	0.143		
Coefficient of Variation	0.248		
Skewness	0.865		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.879	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.621	95% H-UCL	0.625
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.689
95% Adjusted-CLT UCL (Chen-1995)	0.623	97.5% Chebyshev (MVUE) UCL	0.737
95% Modified-t UCL (Johnson-1978)	0.621	99% Chebyshev (MVUE) UCL	0.832

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0366		
MLE of Mean	0.577		
MLE of Standard Deviation	0.145		
nu star	978.1		
Approximate Chi Square Value (.05)	906.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.619
Adjusted Chi Square Value	902.7	95% Jackknife UCL	0.621
		95% Standard Bootstrap UCL	0.619
Anderson-Darling Test Statistic	1.748	95% Bootstrap-t UCL	0.627
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.632
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	0.619
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.624
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.689
		97.5% Chebyshev(Mean, Sd) UCL	0.738
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.833
95% Approximate Gamma UCL	0.622		
95% Adjusted Gamma UCL	0.625		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.621
		or 95% Modified-t UCL	0.621

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	0.039	Minimum of Log Data	-3.244
Maximum	1.2	Maximum of Log Data	0.182
Mean	0.231	Mean of log Data	-1.713
Median	0.231	SD of log Data	0.706
SD	0.209		
Coefficient of Variation	0.907		
Skewness	3.63		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.564	Shapiro Wilk Test Statistic	0.851
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.295	95% H-UCL	0.303
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.366
95% Adjusted-CLT UCL (Chen-1995)	0.319	97.5% Chebyshev (MVUE) UCL	0.425
95% Modified-t UCL (Johnson-1978)	0.299	99% Chebyshev (MVUE) UCL	0.542

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.984	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.116		
MLE of Mean	0.231		
MLE of Standard Deviation	0.164		
nu star	123		
Approximate Chi Square Value (.05)	98.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.293
Adjusted Chi Square Value	97.2	95% Jackknife UCL	0.295
		95% Standard Bootstrap UCL	0.29
Anderson-Darling Test Statistic	2.56	95% Bootstrap-t UCL	0.371
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	0.621
Kolmogorov-Smirnov Test Statistic	0.313	95% Percentile Bootstrap UCL	0.296
Kolmogorov-Smirnov 5% Critical Value	0.16	95% BCA Bootstrap UCL	0.327
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.395
		97.5% Chebyshev(Mean, Sd) UCL	0.466
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.605
95% Approximate Gamma UCL	0.289		
95% Adjusted Gamma UCL	0.292		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.395

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics
Minimum	-0.0032	Log Statistics Not Avaliable
Maximum	1.01	
Mean	0.268	
Median	0.268	
SD	0.171	
Coefficient of Variation	0.638	
Skewness	2.805	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.689	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.32	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.32	95% Adjusted-CLT UCL (Chen 1995)	0.335
		95% Modified-t UCL (Johnson-1978)	0.323

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.402	95% CLT UCL	0.319
		95% Jackknife UCL	0.32
		95% Standard Bootstrap UCL	0.318
		95% Bootstrap-t UCL	0.353
		95% Hall's Bootstrap UCL	0.591
		95% Percentile Bootstrap UCL	0.321
		95% BCA Bootstrap UCL	0.338
		95% Chebyshev(Mean, Sd) UCL	0.402
		97.5% Chebyshev(Mean, Sd) UCL	0.46
		99% Chebyshev(Mean, Sd) UCL	0.574

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	28

Raw Statistics		Log-transformed Statistics
Minimum	-93.66	Log Statistics Not Avaliable
Maximum	1370	
Mean	93.14	
Median	22.8	
SD	272.9	
Coefficient of Variation	2.93	
Skewness	3.717	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.595	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	176.3	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	176.3	95% Adjusted-CLT UCL (Chen 1995)		208.7
		95% Modified-t UCL (Johnson-1978)		181.8

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	306.8	95% CLT UCL	173.8
		95% Jackknife UCL	176.3
		95% Standard Bootstrap UCL	173.9
		95% Bootstrap-t UCL	271.7
		95% Hall's Bootstrap UCL	543.8
		95% Percentile Bootstrap UCL	178.3
		95% BCA Bootstrap UCL	213.8
		95% Chebyshev(Mean, Sd) UCL	306.8
		97.5% Chebyshev(Mean, Sd) UCL	399.2
		99% Chebyshev(Mean, Sd) UCL	580.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	4.5	Minimum of Log Data	1.504
Maximum	31	Maximum of Log Data	3.434
Mean	9.431	Mean of log Data	2.165
Median	9.431	SD of log Data	0.372
SD	4.82		
Coefficient of Variation	0.511		
Skewness	3.399		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.588	Shapiro Wilk Test Statistic	0.808
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.9	95% H-UCL	10.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.1
95% Adjusted-CLT UCL (Chen-1995)	11.42	97.5% Chebyshev (MVUE) UCL	13.3
95% Modified-t UCL (Johnson-1978)	10.99	99% Chebyshev (MVUE) UCL	15.66

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.895	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.6		
MLE of Mean	9.431		
MLE of Standard Deviation	3.884		
nu star	365.5		
Approximate Chi Square Value (.05)	322.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	10.86
Adjusted Chi Square Value	319.9	95% Jackknife UCL	10.9
		95% Standard Bootstrap UCL	10.82
Anderson-Darling Test Statistic	2.905	95% Bootstrap-t UCL	12.55
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	18.9
Kolmogorov-Smirnov Test Statistic	0.351	95% Percentile Bootstrap UCL	10.89
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	11.63
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.2
		97.5% Chebyshev(Mean, Sd) UCL	14.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.05
95% Approximate Gamma UCL	10.7		
95% Adjusted Gamma UCL	10.77		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.9
	or 95% Modified-t UCL	10.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics
Minimum	-0.0175	Log Statistics Not Avaliable
Maximum	0.0468	
Mean	0.0203	
Median	0.0203	
SD	0.0127	
Coefficient of Variation	0.627	
Skewness	-1.072	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.797	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0241	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.0241	95% Adjusted-CLT UCL (Chen 1995)	0.0235
		95% Modified-t UCL (Johnson-1978)	0.0241

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0302	95% CLT UCL	0.024
		95% Jackknife UCL	0.0241
		95% Standard Bootstrap UCL	0.024
		95% Bootstrap-t UCL	0.0238
		95% Hall's Bootstrap UCL	0.0236
		95% Percentile Bootstrap UCL	0.0239
		95% BCA Bootstrap UCL	0.0234
		95% Chebyshev(Mean, Sd) UCL	0.0302
		97.5% Chebyshev(Mean, Sd) UCL	0.0345
		99% Chebyshev(Mean, Sd) UCL	0.043

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	280	Minimum of Log Data	5.635
Maximum	2230	Maximum of Log Data	7.71
Mean	950.7	Mean of log Data	6.781
Median	950.7	SD of log Data	0.412
SD	373.8		
Coefficient of Variation	0.393		
Skewness	1.307		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.822	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1065	95% H-UCL	1103
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1274
95% Adjusted-CLT UCL (Chen-1995)	1078	97.5% Chebyshev (MVUE) UCL	1411
95% Modified-t UCL (Johnson-1978)	1067	99% Chebyshev (MVUE) UCL	1681

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.124	Data do not follow a Discernable Distribution (0.05)	
Theta Star	155.3		
MLE of Mean	950.7		
MLE of Standard Deviation	384.2		
nu star	379.7		
Approximate Chi Square Value (.05)	335.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	1061
Adjusted Chi Square Value	333.2	95% Jackknife UCL	1065
		95% Standard Bootstrap UCL	1056
Anderson-Darling Test Statistic	2.336	95% Bootstrap-t UCL	1088
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	1130
Kolmogorov-Smirnov Test Statistic	0.293	95% Percentile Bootstrap UCL	1063
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	1066
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1243
		97.5% Chebyshev(Mean, Sd) UCL	1370
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1619
95% Approximate Gamma UCL	1076		
95% Adjusted Gamma UCL	1083		

Potential UCL to Use		
	Use 95% Student's-t UCL	1065
	or 95% Modified-t UCL	1067

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics
Minimum	-0.005	Log Statistics Not Avaliable
Maximum	0.19	
Mean	0.0207	
Median	0.0207	
SD	0.0344	
Coefficient of Variation	1.667	
Skewness	4.24	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.502	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0312	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0312	95% Adjusted-CLT UCL (Chen 1995)		0.0359
		95% Modified-t UCL (Johnson-1978)		0.0319

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0476	95% CLT UCL	0.0308
		95% Jackknife UCL	0.0312
		95% Standard Bootstrap UCL	0.0307
		95% Bootstrap-t UCL	0.0464
		95% Hall's Bootstrap UCL	0.0799
		95% Percentile Bootstrap UCL	0.032
		95% BCA Bootstrap UCL	0.038
		95% Chebyshev(Mean, Sd) UCL	0.0476
		97.5% Chebyshev(Mean, Sd) UCL	0.0593
		99% Chebyshev(Mean, Sd) UCL	0.0822

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	16
Raw Statistics		Log-transformed Statistics	
Minimum	0.04	Minimum of Log Data	-3.219
Maximum	79	Maximum of Log Data	4.369
Mean	5.334	Mean of log Data	0.119
Median	1	SD of log Data	1.837
SD	14.5		
Coefficient of Variation	2.718		
Skewness	4.735		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.373	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.752	95% H-UCL	20.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.57
95% Adjusted-CLT UCL (Chen-1995)	11.98	97.5% Chebyshev (MVUE) UCL	19.99
95% Modified-t UCL (Johnson-1978)	10.12	99% Chebyshev (MVUE) UCL	28.68
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.401	Data appear Lognormal at 5% Significance Level	
Theta Star	13.31		
MLE of Mean	5.334		
MLE of Standard Deviation	8.426		
nu star	24.85		
Approximate Chi Square Value (.05)	14.49	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	9.616
Adjusted Chi Square Value	14.05	95% Jackknife UCL	9.752
		95% Standard Bootstrap UCL	9.559
Anderson-Darling Test Statistic	1.833	95% Bootstrap-t UCL	25.58
Anderson-Darling 5% Critical Value	0.828	95% Hall's Bootstrap UCL	24.47
Kolmogorov-Smirnov Test Statistic	0.234	95% Percentile Bootstrap UCL	10.18
Kolmogorov-Smirnov 5% Critical Value	0.169	95% BCA Bootstrap UCL	14.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.68
		97.5% Chebyshev(Mean, Sd) UCL	21.59
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31.24
95% Approximate Gamma UCL	9.143		
95% Adjusted Gamma UCL	9.43		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	16.68

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	1.2	Maximum of Log Data	0.182
Mean	0.32	Mean of log Data	-1.265
Median	0.32	SD of log Data	0.47
SD	0.206		
Coefficient of Variation	0.645		
Skewness	3.055		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.63	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.383	95% H-UCL	0.371
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.434
95% Adjusted-CLT UCL (Chen-1995)	0.403	97.5% Chebyshev (MVUE) UCL	0.486
95% Modified-t UCL (Johnson-1978)	0.386	99% Chebyshev (MVUE) UCL	0.588

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.765	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.085		
MLE of Mean	0.32		
MLE of Standard Deviation	0.165		
nu star	233.5		
Approximate Chi Square Value (.05)	199.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.381
Adjusted Chi Square Value	197.3	95% Jackknife UCL	0.383
		95% Standard Bootstrap UCL	0.38
Anderson-Darling Test Statistic	2.304	95% Bootstrap-t UCL	0.436
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.664
Kolmogorov-Smirnov Test Statistic	0.338	95% Percentile Bootstrap UCL	0.384
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.407
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.481
		97.5% Chebyshev(Mean, Sd) UCL	0.551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.689
95% Approximate Gamma UCL	0.375		
95% Adjusted Gamma UCL	0.379		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.383
	or 95% Modified-t UCL	0.386

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.0656	Minimum of Log Data	-2.724
Maximum	9.829	Maximum of Log Data	2.285
Mean	0.982	Mean of log Data	-0.52
Median	0.982	SD of log Data	0.978
SD	1.679		
Coefficient of Variation	1.709		
Skewness	5.176		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.35	Shapiro Wilk Test Statistic	0.825
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.494	95% H-UCL	1.471
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.761
95% Adjusted-CLT UCL (Chen-1995)	1.778	97.5% Chebyshev (MVUE) UCL	2.116
95% Modified-t UCL (Johnson-1978)	1.541	99% Chebyshev (MVUE) UCL	2.816
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.045	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.94		
MLE of Mean	0.982		
MLE of Standard Deviation	0.961		
nu star	64.81		
Approximate Chi Square Value (.05)	47.29	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	1.478
Adjusted Chi Square Value	46.45	95% Jackknife UCL	1.494
		95% Standard Bootstrap UCL	1.461
Anderson-Darling Test Statistic	2.748	95% Bootstrap-t UCL	2.686
Anderson-Darling 5% Critical Value	0.772	95% Hall's Bootstrap UCL	3.572
Kolmogorov-Smirnov Test Statistic	0.311	95% Percentile Bootstrap UCL	1.578
Kolmogorov-Smirnov 5% Critical Value	0.162	95% BCA Bootstrap UCL	1.916
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.297
		97.5% Chebyshev(Mean, Sd) UCL	2.866
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.983
95% Approximate Gamma UCL	1.346		
95% Adjusted Gamma UCL	1.37		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.297

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	28

Raw Statistics		Log-transformed Statistics
Minimum	-5.64	Log Statistics Not Avaliable
Maximum	6410	
Mean	481.5	
Median	98.63	
SD	1179	
Coefficient of Variation	2.449	
Skewness	4.596	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.409	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	841	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	841	95% Adjusted-CLT UCL (Chen 1995)		1017
		95% Modified-t UCL (Johnson-1978)		870.2

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	1405	95% CLT UCL	829.9
		95% Jackknife UCL	841
		95% Standard Bootstrap UCL	831.4
		95% Bootstrap-t UCL	1688
		95% Hall's Bootstrap UCL	2328
		95% Percentile Bootstrap UCL	872
		95% BCA Bootstrap UCL	1121
		95% Chebyshev(Mean, Sd) UCL	1405
		97.5% Chebyshev(Mean, Sd) UCL	1804
		99% Chebyshev(Mean, Sd) UCL	2589

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.222	Minimum of Log Data	-1.505
Maximum	136	Maximum of Log Data	4.913
Mean	18.63	Mean of log Data	2.023
Median	18.63	SD of log Data	1.655
SD	26.3		
Coefficient of Variation	1.412		
Skewness	3.41		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.576	Shapiro Wilk Test Statistic	0.852
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	26.64	95% H-UCL	80.62
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	72.62
95% Adjusted-CLT UCL (Chen-1995)	29.49	97.5% Chebyshev (MVUE) UCL	92.33
95% Modified-t UCL (Johnson-1978)	27.13	99% Chebyshev (MVUE) UCL	131

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.63	Data do not follow a Discernable Distribution (0.05)	
Theta Star	29.56		
MLE of Mean	18.63		
MLE of Standard Deviation	23.47		
nu star	39.06		
Approximate Chi Square Value (.05)	25.75	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	26.4
Adjusted Chi Square Value	25.15	95% Jackknife UCL	26.64
		95% Standard Bootstrap UCL	26.4
Anderson-Darling Test Statistic	1.779	95% Bootstrap-t UCL	36.73
Anderson-Darling 5% Critical Value	0.794	95% Hall's Bootstrap UCL	62.93
Kolmogorov-Smirnov Test Statistic	0.244	95% Percentile Bootstrap UCL	26.92
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	29.44
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.21
		97.5% Chebyshev(Mean, Sd) UCL	48.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	65.62
95% Approximate Gamma UCL	28.26		
95% Adjusted Gamma UCL	28.94		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	39.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0293	Minimum of Log Data	-3.53
Maximum	19.6	Maximum of Log Data	2.976
Mean	3.357	Mean of log Data	0.3
Median	3.357	SD of log Data	1.704
SD	4.388		
Coefficient of Variation	1.307		
Skewness	2.752		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.61	Shapiro Wilk Test Statistic	0.842
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.694	95% H-UCL	16.44
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.27
95% Adjusted-CLT UCL (Chen-1995)	5.069	97.5% Chebyshev (MVUE) UCL	18.2
95% Modified-t UCL (Johnson-1978)	4.759	99% Chebyshev (MVUE) UCL	25.9

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.625	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.373		
MLE of Mean	3.357		
MLE of Standard Deviation	4.247		
nu star	38.73		
Approximate Chi Square Value (.05)	25.48	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	4.653
Adjusted Chi Square Value	24.88	95% Jackknife UCL	4.694
		95% Standard Bootstrap UCL	4.644
Anderson-Darling Test Statistic	1.93	95% Bootstrap-t UCL	6.219
Anderson-Darling 5% Critical Value	0.795	95% Hall's Bootstrap UCL	11.56
Kolmogorov-Smirnov Test Statistic	0.243	95% Percentile Bootstrap UCL	4.741
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	5.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.792
		97.5% Chebyshev(Mean, Sd) UCL	8.279
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.2
95% Approximate Gamma UCL	5.103		
95% Adjusted Gamma UCL	5.226		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.792

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	1.1	Minimum of Log Data	0.0953
Maximum	1340	Maximum of Log Data	7.2
Mean	182.2	Mean of log Data	4.233
Median	182.2	SD of log Data	1.772
SD	260.3		
Coefficient of Variation	1.429		
Skewness	3.403		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	261.6	95% H-UCL	1018
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	835.3
95% Adjusted-CLT UCL (Chen-1995)	289.7	97.5% Chebyshev (MVUE) UCL	1069
95% Modified-t UCL (Johnson-1978)	266.4	99% Chebyshev (MVUE) UCL	1528

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.591	Data do not follow a Discernable Distribution (0.05)	
Theta Star	308.1		
MLE of Mean	182.2		
MLE of Standard Deviation	237		
nu star	36.67		
Approximate Chi Square Value (.05)	23.81	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	259.1
Adjusted Chi Square Value	23.23	95% Jackknife UCL	261.6
		95% Standard Bootstrap UCL	258.4
Anderson-Darling Test Statistic	1.796	95% Bootstrap-t UCL	343.9
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	628.5
Kolmogorov-Smirnov Test Statistic	0.245	95% Percentile Bootstrap UCL	263.9
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	287.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	386
		97.5% Chebyshev(Mean, Sd) UCL	474.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	647.4
95% Approximate Gamma UCL	280.7		
95% Adjusted Gamma UCL	287.6		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	386

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	14	Minimum of Log Data	2.639
Maximum	71.6	Maximum of Log Data	4.271
Mean	29.71	Mean of log Data	3.33
Median	29.71	SD of log Data	0.352
SD	11.46		
Coefficient of Variation	0.386		
Skewness	1.79		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	33.21	95% H-UCL	33.42
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.02
95% Adjusted-CLT UCL (Chen-1995)	33.8	97.5% Chebyshev (MVUE) UCL	41.64
95% Modified-t UCL (Johnson-1978)	33.32	99% Chebyshev (MVUE) UCL	48.76

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.46	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.983		
MLE of Mean	29.71		
MLE of Standard Deviation	10.88		
nu star	462.5		
Approximate Chi Square Value (.05)	413.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	33.1
Adjusted Chi Square Value	411.1	95% Jackknife UCL	33.21
		95% Standard Bootstrap UCL	33.06
Anderson-Darling Test Statistic	1.579	95% Bootstrap-t UCL	34.11
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	36.6
Kolmogorov-Smirnov Test Statistic	0.26	95% Percentile Bootstrap UCL	33.28
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	34.03
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38.68
		97.5% Chebyshev(Mean, Sd) UCL	42.56
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50.19
95% Approximate Gamma UCL	33.22		
95% Adjusted Gamma UCL	33.43		

Potential UCL to Use		
	Use 95% Student's-t UCL	33.21
	or 95% Modified-t UCL	33.32

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	561-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	3.5	Maximum of Log Data	1.253
Mean	0.495	Mean of log Data	-0.95
Median	0.495	SD of log Data	0.62
SD	0.572		
Coefficient of Variation	1.155		
Skewness	4.946		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.41	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.666	95% H-UCL	0.588
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.703
95% Adjusted-CLT UCL (Chen-1995)	0.756	97.5% Chebyshev (MVUE) UCL	0.805
95% Modified-t UCL (Johnson-1978)	0.681	99% Chebyshev (MVUE) UCL	1.007

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.994	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.248		
MLE of Mean	0.495		
MLE of Standard Deviation	0.351		
nu star	127.6		
Approximate Chi Square Value (.05)	102.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.661
Adjusted Chi Square Value	101.3	95% Jackknife UCL	0.666
		95% Standard Bootstrap UCL	0.656
Anderson-Darling Test Statistic	2.773	95% Bootstrap-t UCL	0.974
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	1.376
Kolmogorov-Smirnov Test Statistic	0.316	95% Percentile Bootstrap UCL	0.681
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.793
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.936
		97.5% Chebyshev(Mean, Sd) UCL	1.126
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.501
95% Approximate Gamma UCL	0.616		
95% Adjusted Gamma UCL	0.623		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.936

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Arsenic

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	5.9	Minimum of Log Data	1.775
Maximum	33.1	Maximum of Log Data	3.5
Mean	14.96	Mean of log Data	2.643
Median	14.96	SD of log Data	0.37
SD	5.288		
Coefficient of Variation	0.353		
Skewness	1.047		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.55	95% H-UCL	17.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19.41
95% Adjusted-CLT UCL (Chen-1995)	16.69	97.5% Chebyshev (MVUE) UCL	21.31
95% Modified-t UCL (Johnson-1978)	16.58	99% Chebyshev (MVUE) UCL	25.05

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.448	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.009		
MLE of Mean	14.96		
MLE of Standard Deviation	5.482		
nu star	476.7		
Approximate Chi Square Value (.05)	427.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	16.5
Adjusted Chi Square Value	424.6	95% Jackknife UCL	16.55
		95% Standard Bootstrap UCL	16.5
Anderson-Darling Test Statistic	2.115	95% Bootstrap-t UCL	16.75
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	17.23
Kolmogorov-Smirnov Test Statistic	0.296	95% Percentile Bootstrap UCL	16.53
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	16.58
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.04
		97.5% Chebyshev(Mean, Sd) UCL	20.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.26
95% Approximate Gamma UCL	16.7		
95% Adjusted Gamma UCL	16.8		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.55
	or 95% Modified-t UCL	16.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	70.7	Minimum of Log Data	4.258
Maximum	438	Maximum of Log Data	6.082
Mean	122.3	Mean of log Data	4.751
Median	122.3	SD of log Data	0.289
SD	59.84		
Coefficient of Variation	0.489		
Skewness	4.992		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.402	Shapiro Wilk Test Statistic	0.649
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	140.2	95% H-UCL	132.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	147.7
95% Adjusted-CLT UCL (Chen-1995)	149.7	97.5% Chebyshev (MVUE) UCL	159.5
95% Modified-t UCL (Johnson-1978)	141.8	99% Chebyshev (MVUE) UCL	182.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.318	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.7		
MLE of Mean	122.3		
MLE of Standard Deviation	42.4		
nu star	532.4		
Approximate Chi Square Value (.05)	479.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	139.7
Adjusted Chi Square Value	477.2	95% Jackknife UCL	140.2
		95% Standard Bootstrap UCL	139.3
Anderson-Darling Test Statistic	4.402	95% Bootstrap-t UCL	169.1
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	215.4
Kolmogorov-Smirnov Test Statistic	0.394	95% Percentile Bootstrap UCL	142.2
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	154.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	168.4
		97.5% Chebyshev(Mean, Sd) UCL	188.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	227.5
95% Approximate Gamma UCL	135.7		
95% Adjusted Gamma UCL	136.4		
Potential UCL to Use		Use 95% Student's-t UCL	140.2
		or 95% Modified-t UCL	141.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.42	Minimum of Log Data	-0.868
Maximum	1.5	Maximum of Log Data	0.405
Mean	0.632	Mean of log Data	-0.485
Median	0.632	SD of log Data	0.215
SD	0.178		
Coefficient of Variation	0.281		
Skewness	3.867		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.552	Shapiro Wilk Test Statistic	0.719
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.685	95% H-UCL	0.674
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.735
95% Adjusted-CLT UCL (Chen-1995)	0.706	97.5% Chebyshev (MVUE) UCL	0.781
95% Modified-t UCL (Johnson-1978)	0.689	99% Chebyshev (MVUE) UCL	0.87

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.49	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0361		
MLE of Mean	0.632		
MLE of Standard Deviation	0.151		
nu star	1120		
Approximate Chi Square Value (.05)	1043	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.684
Adjusted Chi Square Value	1039	95% Jackknife UCL	0.685
		95% Standard Bootstrap UCL	0.681
Anderson-Darling Test Statistic	3.741	95% Bootstrap-t UCL	0.73
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.937
Kolmogorov-Smirnov Test Statistic	0.306	95% Percentile Bootstrap UCL	0.687
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	0.709
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.769
		97.5% Chebyshev(Mean, Sd) UCL	0.828
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.944
95% Approximate Gamma UCL	0.678		
95% Adjusted Gamma UCL	0.681		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.685
	or 95% Modified-t UCL	0.689

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	32

Raw Statistics		Log-transformed Statistics
Minimum	-89.55	Log Statistics Not Avaliable
Maximum	432	
Mean	11.35	
Median	12.17	
SD	96.6	
Coefficient of Variation	8.515	
Skewness	2.834	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.738	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	40.3	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	40.3	95% Adjusted-CLT UCL (Chen 1995)	48.58
		95% Modified-t UCL (Johnson-1978)	41.73

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	85.78	95% CLT UCL	39.44
		95% Jackknife UCL	40.3
		95% Standard Bootstrap UCL	38.82
		95% Bootstrap-t UCL	55.59
		95% Hall's Bootstrap UCL	172.1
		95% Percentile Bootstrap UCL	40.27
		95% BCA Bootstrap UCL	54.02
		95% Chebyshev(Mean, Sd) UCL	85.78
		97.5% Chebyshev(Mean, Sd) UCL	118
		99% Chebyshev(Mean, Sd) UCL	181.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	30.9	Maximum of Log Data	3.431
Mean	9.375	Mean of log Data	2.177
Median	9.375	SD of log Data	0.317
SD	4.399		
Coefficient of Variation	0.469		
Skewness	4.067		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.533	Shapiro Wilk Test Statistic	0.776
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.69	95% H-UCL	10.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.56
95% Adjusted-CLT UCL (Chen-1995)	11.25	97.5% Chebyshev (MVUE) UCL	12.56
95% Modified-t UCL (Johnson-1978)	10.79	99% Chebyshev (MVUE) UCL	14.51

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.64	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.227		
MLE of Mean	9.375		
MLE of Standard Deviation	3.392		
nu star	488.9		
Approximate Chi Square Value (.05)	438.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	10.65
Adjusted Chi Square Value	436.1	95% Jackknife UCL	10.69
		95% Standard Bootstrap UCL	10.62
Anderson-Darling Test Statistic	3.204	95% Bootstrap-t UCL	12.48
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	17
Kolmogorov-Smirnov Test Statistic	0.36	95% Percentile Bootstrap UCL	10.78
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	11.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.76
		97.5% Chebyshev(Mean, Sd) UCL	14.23
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.11
95% Approximate Gamma UCL	10.45		
95% Adjusted Gamma UCL	10.51		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.69
	or 95% Modified-t UCL	10.79

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics
Minimum	-0.009	Log Statistics Not Avaliable
Maximum	0.297	
Mean	0.032	
Median	0.032	
SD	0.0501	
Coefficient of Variation	1.566	
Skewness	5.023	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.389	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.047	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.047	95% Adjusted-CLT UCL (Chen 1995)		0.055
		95% Modified-t UCL (Johnson-1978)		0.0483

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0706	95% CLT UCL	0.0466
		95% Jackknife UCL	0.047
		95% Standard Bootstrap UCL	0.0462
		95% Bootstrap-t UCL	0.0715
		95% Hall's Bootstrap UCL	0.11
		95% Percentile Bootstrap UCL	0.049
		95% BCA Bootstrap UCL	0.059
		95% Chebyshev(Mean, Sd) UCL	0.0706
		97.5% Chebyshev(Mean, Sd) UCL	0.0873
		99% Chebyshev(Mean, Sd) UCL	0.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	16

Raw Statistics		Log-transformed Statistics	
Minimum	11700	Minimum of Log Data	9.367
Maximum	48500	Maximum of Log Data	10.79
Mean	18613	Mean of log Data	9.796
Median	18613	SD of log Data	0.247
SD	6190		
Coefficient of Variation	0.333		
Skewness	3.802		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.581	Shapiro Wilk Test Statistic	0.775
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	20468	95% H-UCL	20041
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22078
95% Adjusted-CLT UCL (Chen-1995)	21198	97.5% Chebyshev (MVUE) UCL	23622
95% Modified-t UCL (Johnson-1978)	20590	99% Chebyshev (MVUE) UCL	26655

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.08	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1423		
MLE of Mean	18613		
MLE of Standard Deviation	5146		
nu star	837.3		
Approximate Chi Square Value (.05)	771.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	20412
Adjusted Chi Square Value	767.8	95% Jackknife UCL	20468
		95% Standard Bootstrap UCL	20384
Anderson-Darling Test Statistic	3.014	95% Bootstrap-t UCL	22208
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	28853
Kolmogorov-Smirnov Test Statistic	0.34	95% Percentile Bootstrap UCL	20755
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	21726
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23382
		97.5% Chebyshev(Mean, Sd) UCL	25446
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29499
95% Approximate Gamma UCL	20209		
95% Adjusted Gamma UCL	20298		

Potential UCL to Use		
	Use 95% Student's-t UCL	20468
	or 95% Modified-t UCL	20590

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	17
Raw Statistics		Log-transformed Statistics	
Minimum	364	Minimum of Log Data	5.897
Maximum	5230	Maximum of Log Data	8.562
Mean	953.8	Mean of log Data	6.691
Median	953.8	SD of log Data	0.513
SD	850		
Coefficient of Variation	0.891		
Skewness	4.431		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.464	Shapiro Wilk Test Statistic	0.806
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1209	95% H-UCL	1098
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1292
95% Adjusted-CLT UCL (Chen-1995)	1327	97.5% Chebyshev (MVUE) UCL	1455
95% Modified-t UCL (Johnson-1978)	1228	99% Chebyshev (MVUE) UCL	1776
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.836	Data do not follow a Discernable Distribution (0.05)	
Theta Star	336.3		
MLE of Mean	953.8		
MLE of Standard Deviation	566.4		
nu star	181.5		
Approximate Chi Square Value (.05)	151.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	1201
Adjusted Chi Square Value	149.9	95% Jackknife UCL	1209
		95% Standard Bootstrap UCL	1189
Anderson-Darling Test Statistic	3.017	95% Bootstrap-t UCL	1675
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	2411
Kolmogorov-Smirnov Test Statistic	0.362	95% Percentile Bootstrap UCL	1215
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	1360
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1609
		97.5% Chebyshev(Mean, Sd) UCL	1892
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2449
95% Approximate Gamma UCL	1144		
95% Adjusted Gamma UCL	1155		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1609

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics
Minimum	-0.0052	Log Statistics Not Avaliable
Maximum	0.139	
Mean	0.0083	
Median	0.0083	
SD	0.0244	
Coefficient of Variation	2.928	
Skewness	5.259	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.339	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0156	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0156	95% Adjusted-CLT UCL (Chen 1995)		0.0197
		95% Modified-t UCL (Johnson-1978)		0.0163

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0271	95% CLT UCL	0.0154
		95% Jackknife UCL	0.0156
		95% Standard Bootstrap UCL	0.0154
		95% Bootstrap-t UCL	0.0314
		95% Hall's Bootstrap UCL	0.0455
		95% Percentile Bootstrap UCL	0.0163
		95% BCA Bootstrap UCL	0.023
		95% Chebyshev(Mean, Sd) UCL	0.0271
		97.5% Chebyshev(Mean, Sd) UCL	0.0353
		99% Chebyshev(Mean, Sd) UCL	0.0512

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	0.04	Minimum of Log Data	-3.219
Maximum	2.2	Maximum of Log Data	0.788
Mean	0.678	Mean of log Data	-0.79
Median	0.839	SD of log Data	1.119
SD	0.473		
Coefficient of Variation	0.697		
Skewness	0.785		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.828	Shapiro Wilk Test Statistic	0.79
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.82	95% H-UCL	1.424
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.663
95% Adjusted-CLT UCL (Chen-1995)	0.828	97.5% Chebyshev (MVUE) UCL	2.026
95% Modified-t UCL (Johnson-1978)	0.822	99% Chebyshev (MVUE) UCL	2.739
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.279	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.53		
MLE of Mean	0.678		
MLE of Standard Deviation	0.6		
nu star	81.86		
Approximate Chi Square Value (.05)	62.01	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.815
Adjusted Chi Square Value	61.08	95% Jackknife UCL	0.82
		95% Standard Bootstrap UCL	0.814
Anderson-Darling Test Statistic	2.207	95% Bootstrap-t UCL	0.834
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	0.839
Kolmogorov-Smirnov Test Statistic	0.278	95% Percentile Bootstrap UCL	0.816
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	0.821
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.042
		97.5% Chebyshev(Mean, Sd) UCL	1.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.509
95% Approximate Gamma UCL	0.895		
95% Adjusted Gamma UCL	0.909		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.042

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.14	Minimum of Log Data	-1.966
Maximum	0.52	Maximum of Log Data	-0.654
Mean	0.304	Mean of log Data	-1.235
Median	0.304	SD of log Data	0.311
SD	0.094		
Coefficient of Variation	0.309		
Skewness	0.781		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.83	Shapiro Wilk Test Statistic	0.863
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.333	95% H-UCL	0.337
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.379
95% Adjusted-CLT UCL (Chen-1995)	0.334	97.5% Chebyshev (MVUE) UCL	0.411
95% Modified-t UCL (Johnson-1978)	0.333	99% Chebyshev (MVUE) UCL	0.474

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.06	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0303		
MLE of Mean	0.304		
MLE of Standard Deviation	0.096		
nu star	643.9		
Approximate Chi Square Value (.05)	586	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.332
Adjusted Chi Square Value	583	95% Jackknife UCL	0.333
		95% Standard Bootstrap UCL	0.331
Anderson-Darling Test Statistic	2.407	95% Bootstrap-t UCL	0.337
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.336
Kolmogorov-Smirnov Test Statistic	0.304	95% Percentile Bootstrap UCL	0.331
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	0.334
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.377
		97.5% Chebyshev(Mean, Sd) UCL	0.408
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.47
95% Approximate Gamma UCL	0.334		
95% Adjusted Gamma UCL	0.336		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.333
	or 95% Modified-t UCL	0.333

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.0663	Minimum of Log Data	-2.713
Maximum	0.43	Maximum of Log Data	-0.844
Mean	0.373	Mean of log Data	-1.026
Median	0.373	SD of log Data	0.347
SD	0.0713		
Coefficient of Variation	0.191		
Skewness	-3.497		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.514	Shapiro Wilk Test Statistic	0.388
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.394	95% H-UCL	0.427
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.484
95% Adjusted-CLT UCL (Chen-1995)	0.385	97.5% Chebyshev (MVUE) UCL	0.529
95% Modified-t UCL (Johnson-1978)	0.393	99% Chebyshev (MVUE) UCL	0.617
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.96	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0312		
MLE of Mean	0.373		
MLE of Standard Deviation	0.108		
nu star	765.4		
Approximate Chi Square Value (.05)	702.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.393
Adjusted Chi Square Value	699	95% Jackknife UCL	0.394
		95% Standard Bootstrap UCL	0.393
Anderson-Darling Test Statistic	7.183	95% Bootstrap-t UCL	0.387
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.388
Kolmogorov-Smirnov Test Statistic	0.474	95% Percentile Bootstrap UCL	0.391
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	0.389
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.427
		97.5% Chebyshev(Mean, Sd) UCL	0.451
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.498
95% Approximate Gamma UCL	0.406		
95% Adjusted Gamma UCL	0.408		
Potential UCL to Use		Use 95% Student's-t UCL	0.394
		or 95% Modified-t UCL	0.393

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	32

Raw Statistics		Log-transformed Statistics
Minimum	-14.96	Log Statistics Not Avaliable
Maximum	1370	
Mean	68.91	
Median	1.95	
SD	254.2	
Coefficient of Variation	3.689	
Skewness	4.714	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.325	Not Available
Shapiro Wilk Critical Value	0.93	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	145.1	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	145.1	95% Adjusted-CLT UCL (Chen 1995)		182.8
		95% Modified-t UCL (Johnson-1978)		151.3

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	264.8	95% CLT UCL	142.8
		95% Jackknife UCL	145.1
		95% Standard Bootstrap UCL	142.5
		95% Bootstrap-t UCL	327.3
		95% Hall's Bootstrap UCL	352.4
		95% Percentile Bootstrap UCL	153.1
		95% BCA Bootstrap UCL	202.2
		95% Chebyshev(Mean, Sd) UCL	264.8
		97.5% Chebyshev(Mean, Sd) UCL	349.5
		99% Chebyshev(Mean, Sd) UCL	516

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.128	Minimum of Log Data	-2.056
Maximum	37.78	Maximum of Log Data	3.632
Mean	2.842	Mean of log Data	0.203
Median	2.842	SD of log Data	1.272
SD	6.485		
Coefficient of Variation	2.282		
Skewness	5.354		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.316	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.785	95% H-UCL	5.182
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.779
95% Adjusted-CLT UCL (Chen-1995)	5.887	97.5% Chebyshev (MVUE) UCL	7.14
95% Modified-t UCL (Johnson-1978)	4.966	99% Chebyshev (MVUE) UCL	9.813

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.669	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.245		
MLE of Mean	2.842		
MLE of Standard Deviation	3.473		
nu star	42.84		
Approximate Chi Square Value (.05)	28.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	4.727
Adjusted Chi Square Value	28.22	95% Jackknife UCL	4.785
		95% Standard Bootstrap UCL	4.654
Anderson-Darling Test Statistic	2.523	95% Bootstrap-t UCL	10.35
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	12.58
Kolmogorov-Smirnov Test Statistic	0.314	95% Percentile Bootstrap UCL	5.058
Kolmogorov-Smirnov 5% Critical Value	0.162	95% BCA Bootstrap UCL	6.428
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.839
		97.5% Chebyshev(Mean, Sd) UCL	10
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.25
95% Approximate Gamma UCL	4.222		
95% Adjusted Gamma UCL	4.314		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	7.839

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.0136	Minimum of Log Data	-4.298
Maximum	6.788	Maximum of Log Data	1.915
Mean	0.462	Mean of log Data	-1.972
Median	0.462	SD of log Data	1.623
SD	1.174		
Coefficient of Variation	2.541		
Skewness	5.363		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.309	Shapiro Wilk Test Statistic	0.824
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.814	95% H-UCL	1.345
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.248
95% Adjusted-CLT UCL (Chen-1995)	1.013	97.5% Chebyshev (MVUE) UCL	1.582
95% Modified-t UCL (Johnson-1978)	0.847	99% Chebyshev (MVUE) UCL	2.239

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.497	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.93		
MLE of Mean	0.462		
MLE of Standard Deviation	0.655		
nu star	31.8		
Approximate Chi Square Value (.05)	19.92	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.803
Adjusted Chi Square Value	19.41	95% Jackknife UCL	0.814
		95% Standard Bootstrap UCL	0.808
Anderson-Darling Test Statistic	2.688	95% Bootstrap-t UCL	1.77
Anderson-Darling 5% Critical Value	0.808	95% Hall's Bootstrap UCL	2.211
Kolmogorov-Smirnov Test Statistic	0.29	95% Percentile Bootstrap UCL	0.871
Kolmogorov-Smirnov 5% Critical Value	0.164	95% BCA Bootstrap UCL	1.082
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.366
		97.5% Chebyshev(Mean, Sd) UCL	1.758
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.526
95% Approximate Gamma UCL	0.738		
95% Adjusted Gamma UCL	0.757		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.366

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	0.155	Minimum of Log Data	-1.864
Maximum	412.7	Maximum of Log Data	6.023
Mean	27.55	Mean of log Data	1.713
Median	27.55	SD of log Data	2.159
SD	71.47		
Coefficient of Variation	2.594		
Skewness	5.36		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.31	Shapiro Wilk Test Statistic	0.827
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	48.98	95% H-UCL	277.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	152.9
95% Adjusted-CLT UCL (Chen-1995)	61.13	97.5% Chebyshev (MVUE) UCL	198.9
95% Modified-t UCL (Johnson-1978)	50.97	99% Chebyshev (MVUE) UCL	289.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.391	Data do not follow a Discernable Distribution (0.05)	
Theta Star	70.39		
MLE of Mean	27.55		
MLE of Standard Deviation	44.04		
nu star	25.05		
Approximate Chi Square Value (.05)	14.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	48.34
Adjusted Chi Square Value	14.22	95% Jackknife UCL	48.98
		95% Standard Bootstrap UCL	48.31
Anderson-Darling Test Statistic	2.431	95% Bootstrap-t UCL	110.3
Anderson-Darling 5% Critical Value	0.831	95% Hall's Bootstrap UCL	134.2
Kolmogorov-Smirnov Test Statistic	0.269	95% Percentile Bootstrap UCL	52.51
Kolmogorov-Smirnov 5% Critical Value	0.166	95% BCA Bootstrap UCL	67.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.62
		97.5% Chebyshev(Mean, Sd) UCL	106.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	153.3
95% Approximate Gamma UCL	47.11		
95% Adjusted Gamma UCL	48.53		

Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	106.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	17

Raw Statistics		Log-transformed Statistics	
Minimum	18.6	Minimum of Log Data	2.923
Maximum	86.9	Maximum of Log Data	4.465
Mean	34.01	Mean of log Data	3.483
Median	34.01	SD of log Data	0.284
SD	12.1		
Coefficient of Variation	0.356		
Skewness	2.949		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.66	Shapiro Wilk Test Statistic	0.821
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	37.64	95% H-UCL	37.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.37
95% Adjusted-CLT UCL (Chen-1995)	38.72	97.5% Chebyshev (MVUE) UCL	44.63
95% Modified-t UCL (Johnson-1978)	37.83	99% Chebyshev (MVUE) UCL	51.03
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.42	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.263		
MLE of Mean	34.01		
MLE of Standard Deviation	10.53		
nu star	667.2		
Approximate Chi Square Value (.05)	608.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0416	95% CLT UCL	37.53
Adjusted Chi Square Value	605.2	95% Jackknife UCL	37.64
		95% Standard Bootstrap UCL	37.36
Anderson-Darling Test Statistic	2.86	95% Bootstrap-t UCL	40.48
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	56.76
Kolmogorov-Smirnov Test Statistic	0.304	95% Percentile Bootstrap UCL	37.76
Kolmogorov-Smirnov 5% Critical Value	0.155	95% BCA Bootstrap UCL	38.87
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	43.34
		97.5% Chebyshev(Mean, Sd) UCL	47.37
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	55.3
95% Approximate Gamma UCL	37.31		
95% Adjusted Gamma UCL	37.49		
Potential UCL to Use		Use 95% Student's-t UCL	37.64
		or 95% Modified-t UCL	37.83

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	561-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	0.13	Minimum of Log Data	-2.04
Maximum	22	Maximum of Log Data	3.091
Mean	2.348	Mean of log Data	0.142
Median	2.348	SD of log Data	1.317
SD	3.815		
Coefficient of Variation	1.625		
Skewness	4.812		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.411	Shapiro Wilk Test Statistic	0.787
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.511	95% H-UCL	5.419
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.924
95% Adjusted-CLT UCL (Chen-1995)	4.108	97.5% Chebyshev (MVUE) UCL	7.356
95% Modified-t UCL (Johnson-1978)	3.609	99% Chebyshev (MVUE) UCL	10.17
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.772	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.042		
MLE of Mean	2.348		
MLE of Standard Deviation	2.673		
nu star	47.85		
Approximate Chi Square Value (.05)	32.97	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	3.475
Adjusted Chi Square Value	32.29	95% Jackknife UCL	3.511
		95% Standard Bootstrap UCL	3.444
Anderson-Darling Test Statistic	2.975	95% Bootstrap-t UCL	5.324
Anderson-Darling 5% Critical Value	0.784	95% Hall's Bootstrap UCL	8.237
Kolmogorov-Smirnov Test Statistic	0.29	95% Percentile Bootstrap UCL	3.639
Kolmogorov-Smirnov 5% Critical Value	0.163	95% BCA Bootstrap UCL	4.574
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.334
		97.5% Chebyshev(Mean, Sd) UCL	6.627
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.165
95% Approximate Gamma UCL	3.407		
95% Adjusted Gamma UCL	3.48		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.334

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	39.6	Maximum of Log Data	3.679
Mean	11.09	Mean of log Data	2.305
Median	11.09	SD of log Data	0.431
SD	6.287		
Coefficient of Variation	0.567		
Skewness	3.342		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.602	Shapiro Wilk Test Statistic	0.818
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.01	95% H-UCL	12.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.79
95% Adjusted-CLT UCL (Chen-1995)	13.67	97.5% Chebyshev (MVUE) UCL	16.45
95% Modified-t UCL (Johnson-1978)	13.12	99% Chebyshev (MVUE) UCL	19.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.632	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.395		
MLE of Mean	11.09		
MLE of Standard Deviation	5.154		
nu star	287.2		
Approximate Chi Square Value (.05)	248.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	12.95
Adjusted Chi Square Value	247	95% Jackknife UCL	13.01
		95% Standard Bootstrap UCL	12.87
Anderson-Darling Test Statistic	2.933	95% Bootstrap-t UCL	14.72
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	23.03
Kolmogorov-Smirnov Test Statistic	0.312	95% Percentile Bootstrap UCL	13
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	14.05
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.02
		97.5% Chebyshev(Mean, Sd) UCL	18.14
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.33
95% Approximate Gamma UCL	12.8		
95% Adjusted Gamma UCL	12.9		

Potential UCL to Use		
	Use 95% Student's-t UCL	13.01
	or 95% Modified-t UCL	13.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	1	Maximum of Log Data	0
Mean	0.593	Mean of log Data	-0.548
Median	0.593	SD of log Data	0.23
SD	0.135		
Coefficient of Variation	0.228		
Skewness	0.775		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.833	Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.634	95% H-UCL	0.639
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.701
95% Adjusted-CLT UCL (Chen-1995)	0.636	97.5% Chebyshev (MVUE) UCL	0.747
95% Modified-t UCL (Johnson-1978)	0.635	99% Chebyshev (MVUE) UCL	0.839

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.22	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0325		
MLE of Mean	0.593		
MLE of Standard Deviation	0.139		
nu star	1130		
Approximate Chi Square Value (.05)	1053	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.633
Adjusted Chi Square Value	1049	95% Jackknife UCL	0.634
		95% Standard Bootstrap UCL	0.631
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	0.641
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.646
Kolmogorov-Smirnov Test Statistic	0.288	95% Percentile Bootstrap UCL	0.633
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.635
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.699
		97.5% Chebyshev(Mean, Sd) UCL	0.744
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.834
95% Approximate Gamma UCL	0.636		
95% Adjusted Gamma UCL	0.639		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.634
		or 95% Modified-t UCL	0.635

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	14

Raw Statistics		Log-transformed Statistics	
Minimum	0.046	Minimum of Log Data	-3.079
Maximum	1.2	Maximum of Log Data	0.182
Mean	0.253	Mean of log Data	-1.586
Median	0.253	SD of log Data	0.659
SD	0.205		
Coefficient of Variation	0.811		
Skewness	3.566		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.566	Shapiro Wilk Test Statistic	0.813
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.315	95% H-UCL	0.326
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.392
95% Adjusted-CLT UCL (Chen-1995)	0.338	97.5% Chebyshev (MVUE) UCL	0.453
95% Modified-t UCL (Johnson-1978)	0.319	99% Chebyshev (MVUE) UCL	0.571

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.31	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.109		
MLE of Mean	0.253		
MLE of Standard Deviation	0.166		
nu star	143.2		
Approximate Chi Square Value (.05)	116.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.313
Adjusted Chi Square Value	115.2	95% Jackknife UCL	0.315
		95% Standard Bootstrap UCL	0.311
Anderson-Darling Test Statistic	3.064	95% Bootstrap-t UCL	0.381
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	0.635
Kolmogorov-Smirnov Test Statistic	0.32	95% Percentile Bootstrap UCL	0.318
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	0.346
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.413
		97.5% Chebyshev(Mean, Sd) UCL	0.482
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.619
95% Approximate Gamma UCL	0.31		
95% Adjusted Gamma UCL	0.314		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.413

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.0906	Minimum of Log Data	-2.401
Maximum	1.01	Maximum of Log Data	0.00995
Mean	0.279	Mean of log Data	-1.404
Median	0.279	SD of log Data	0.51
SD	0.166		
Coefficient of Variation	0.595		
Skewness	2.976		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.645	Shapiro Wilk Test Statistic	0.821
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.33	95% H-UCL	0.335
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.395
95% Adjusted-CLT UCL (Chen-1995)	0.345	97.5% Chebyshev (MVUE) UCL	0.445
95% Modified-t UCL (Johnson-1978)	0.332	99% Chebyshev (MVUE) UCL	0.544
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.69	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0756		
MLE of Mean	0.279		
MLE of Standard Deviation	0.145		
nu star	228.8		
Approximate Chi Square Value (.05)	194.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.328
Adjusted Chi Square Value	193	95% Jackknife UCL	0.33
		95% Standard Bootstrap UCL	0.327
Anderson-Darling Test Statistic	2.911	95% Bootstrap-t UCL	0.361
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	0.593
Kolmogorov-Smirnov Test Statistic	0.308	95% Percentile Bootstrap UCL	0.331
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.348
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.409
		97.5% Chebyshev(Mean, Sd) UCL	0.465
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.576
95% Approximate Gamma UCL	0.328		
95% Adjusted Gamma UCL	0.331		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.409

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	28

Raw Statistics		Log-transformed Statistics
Minimum	-119.8	Log Statistics Not Avaliable
Maximum	1370	
Mean	74.57	
Median	21.9	
SD	272.8	
Coefficient of Variation	3.659	
Skewness	3.913	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.557	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	157.7	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	157.7	95% Adjusted-CLT UCL (Chen 1995)		192
		95% Modified-t UCL (Johnson-1978)		163.5

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	288.2	95% CLT UCL	155.2
		95% Jackknife UCL	157.7
		95% Standard Bootstrap UCL	153.4
		95% Bootstrap-t UCL	264.4
		95% Hall's Bootstrap UCL	522.3
		95% Percentile Bootstrap UCL	164.8
		95% BCA Bootstrap UCL	214.7
		95% Chebyshev(Mean, Sd) UCL	288.2
		97.5% Chebyshev(Mean, Sd) UCL	380.6
		99% Chebyshev(Mean, Sd) UCL	562.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	4.5	Minimum of Log Data	1.504
Maximum	31	Maximum of Log Data	3.434
Mean	9.964	Mean of log Data	2.229
Median	9.964	SD of log Data	0.355
SD	4.702		
Coefficient of Variation	0.472		
Skewness	3.342		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.592	Shapiro Wilk Test Statistic	0.797
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.4	95% H-UCL	11.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.68
95% Adjusted-CLT UCL (Chen-1995)	11.89	97.5% Chebyshev (MVUE) UCL	13.89
95% Modified-t UCL (Johnson-1978)	11.48	99% Chebyshev (MVUE) UCL	16.28

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.603	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.509		
MLE of Mean	9.964		
MLE of Standard Deviation	3.878		
nu star	409.4		
Approximate Chi Square Value (.05)	363.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	11.35
Adjusted Chi Square Value	361.1	95% Jackknife UCL	11.4
		95% Standard Bootstrap UCL	11.34
Anderson-Darling Test Statistic	3.174	95% Bootstrap-t UCL	12.94
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	19.28
Kolmogorov-Smirnov Test Statistic	0.354	95% Percentile Bootstrap UCL	11.34
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	12.04
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.65
		97.5% Chebyshev(Mean, Sd) UCL	15.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.37
95% Approximate Gamma UCL	11.22		
95% Adjusted Gamma UCL	11.3		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.4
	or 95% Modified-t UCL	11.48

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics
Minimum	-0.0175	Log Statistics Not Avaliable
Maximum	0.0438	
Mean	0.0196	
Median	0.0196	
SD	0.0103	
Coefficient of Variation	0.528	
Skewness	-1.073	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.8	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0227	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0227	95% Adjusted-CLT UCL (Chen 1995)		0.0222
		95% Modified-t UCL (Johnson-1978)		0.0226

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0276	95% CLT UCL	0.0226
		95% Jackknife UCL	0.0227
		95% Standard Bootstrap UCL	0.0225
		95% Bootstrap-t UCL	0.0224
		95% Hall's Bootstrap UCL	0.0224
		95% Percentile Bootstrap UCL	0.0224
		95% BCA Bootstrap UCL	0.0222
		95% Chebyshev(Mean, Sd) UCL	0.0276
		97.5% Chebyshev(Mean, Sd) UCL	0.0311
		99% Chebyshev(Mean, Sd) UCL	0.038

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	174	Minimum of Log Data	5.159
Maximum	2230	Maximum of Log Data	7.71
Mean	1006	Mean of log Data	6.84
Median	1006	SD of log Data	0.436
SD	358.7		
Coefficient of Variation	0.357		
Skewness	1.024		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.784	Shapiro Wilk Test Statistic	0.728
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1115	95% H-UCL	1193
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1385
95% Adjusted-CLT UCL (Chen-1995)	1125	97.5% Chebyshev (MVUE) UCL	1542
95% Modified-t UCL (Johnson-1978)	1117	99% Chebyshev (MVUE) UCL	1849

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.252	Data do not follow a Discernable Distribution (0.05)	
Theta Star	160.9		
MLE of Mean	1006		
MLE of Standard Deviation	402.4		
nu star	387.6		
Approximate Chi Square Value (.05)	343	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	1112
Adjusted Chi Square Value	340.7	95% Jackknife UCL	1115
		95% Standard Bootstrap UCL	1114
Anderson-Darling Test Statistic	3.471	95% Bootstrap-t UCL	1127
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	1189
Kolmogorov-Smirnov Test Statistic	0.325	95% Percentile Bootstrap UCL	1114
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	1129
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1287
		97.5% Chebyshev(Mean, Sd) UCL	1408
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1647
95% Approximate Gamma UCL	1137		
95% Adjusted Gamma UCL	1145		

Potential UCL to Use		
	Use 95% Student's-t UCL	1115
	or 95% Modified-t UCL	1117

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics
Minimum	-0.005	Log Statistics Not Avaliable
Maximum	0.19	
Mean	0.0199	
Median	0.0199	
SD	0.0348	
Coefficient of Variation	1.748	
Skewness	4.179	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.499	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	0.0305	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	0.0305	95% Adjusted-CLT UCL (Chen 1995)		0.0352
		95% Modified-t UCL (Johnson-1978)		0.0313

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.0471	95% CLT UCL	0.0302
		95% Jackknife UCL	0.0305
		95% Standard Bootstrap UCL	0.03
		95% Bootstrap-t UCL	0.0456
		95% Hall's Bootstrap UCL	0.0787
		95% Percentile Bootstrap UCL	0.0308
		95% BCA Bootstrap UCL	0.0368
		95% Chebyshev(Mean, Sd) UCL	0.0471
		97.5% Chebyshev(Mean, Sd) UCL	0.0589
		99% Chebyshev(Mean, Sd) UCL	0.082

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.04	Minimum of Log Data	-3.219
Maximum	79	Maximum of Log Data	4.369
Mean	5.027	Mean of log Data	-0.117
Median	1	SD of log Data	1.852
SD	14.56		
Coefficient of Variation	2.896		
Skewness	4.739		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.36	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.464	95% H-UCL	16.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.7
95% Adjusted-CLT UCL (Chen-1995)	11.7	97.5% Chebyshev (MVUE) UCL	16.32
95% Modified-t UCL (Johnson-1978)	9.835	99% Chebyshev (MVUE) UCL	23.43
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.367	Data appear Lognormal at 5% Significance Level	
Theta Star	13.69		
MLE of Mean	5.027		
MLE of Standard Deviation	8.295		
nu star	22.77		
Approximate Chi Square Value (.05)	12.92	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	9.327
Adjusted Chi Square Value	12.5	95% Jackknife UCL	9.464
		95% Standard Bootstrap UCL	9.413
Anderson-Darling Test Statistic	2.404	95% Bootstrap-t UCL	24.11
Anderson-Darling 5% Critical Value	0.836	95% Hall's Bootstrap UCL	23.48
Kolmogorov-Smirnov Test Statistic	0.331	95% Percentile Bootstrap UCL	9.619
Kolmogorov-Smirnov 5% Critical Value	0.169	95% BCA Bootstrap UCL	12.92
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.42
		97.5% Chebyshev(Mean, Sd) UCL	21.35
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31.04
95% Approximate Gamma UCL	8.861		
95% Adjusted Gamma UCL	9.153		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	16.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	0.15	Minimum of Log Data	-1.897
Maximum	1.2	Maximum of Log Data	0.182
Mean	0.348	Mean of log Data	-1.158
Median	0.348	SD of log Data	0.426
SD	0.199		
Coefficient of Variation	0.572		
Skewness	3.013		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.632	Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.409	95% H-UCL	0.398
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.461
95% Adjusted-CLT UCL (Chen-1995)	0.427	97.5% Chebyshev (MVUE) UCL	0.512
95% Modified-t UCL (Johnson-1978)	0.412	99% Chebyshev (MVUE) UCL	0.613
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.575	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.076		
MLE of Mean	0.348		
MLE of Standard Deviation	0.163		
nu star	283.6		
Approximate Chi Square Value (.05)	245.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	0.407
Adjusted Chi Square Value	243.7	95% Jackknife UCL	0.409
		95% Standard Bootstrap UCL	0.406
Anderson-Darling Test Statistic	2.616	95% Bootstrap-t UCL	0.461
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	0.706
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	0.408
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.431
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.504
		97.5% Chebyshev(Mean, Sd) UCL	0.571
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.704
95% Approximate Gamma UCL	0.402		
95% Adjusted Gamma UCL	0.405		
Potential UCL to Use		Use 95% Student's-t UCL	0.409
		or 95% Modified-t UCL	0.412

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	0.0989	Minimum of Log Data	-2.314
Maximum	9.829	Maximum of Log Data	2.285
Mean	1.135	Mean of log Data	-0.227
Median	1.135	SD of log Data	0.763
SD	1.655		
Coefficient of Variation	1.458		
Skewness	5.128		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.349	Shapiro Wilk Test Statistic	0.78
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.639	95% H-UCL	1.441
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.743
95% Adjusted-CLT UCL (Chen-1995)	1.916	97.5% Chebyshev (MVUE) UCL	2.041
95% Modified-t UCL (Johnson-1978)	1.685	99% Chebyshev (MVUE) UCL	2.627

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.43	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.793		
MLE of Mean	1.135		
MLE of Standard Deviation	0.949		
nu star	88.67		
Approximate Chi Square Value (.05)	67.96	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	1.624
Adjusted Chi Square Value	66.95	95% Jackknife UCL	1.639
		95% Standard Bootstrap UCL	1.62
Anderson-Darling Test Statistic	3.578	95% Bootstrap-t UCL	2.731
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	3.673
Kolmogorov-Smirnov Test Statistic	0.336	95% Percentile Bootstrap UCL	1.695
Kolmogorov-Smirnov 5% Critical Value	0.161	95% BCA Bootstrap UCL	2.079
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.43
		97.5% Chebyshev(Mean, Sd) UCL	2.991
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.092
95% Approximate Gamma UCL	1.481		
95% Adjusted Gamma UCL	1.503		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	28

Raw Statistics		Log-transformed Statistics
Minimum	-5.64	Log Statistics Not Avaliable
Maximum	6410	
Mean	455.9	
Median	82.4	
SD	1184	
Coefficient of Variation	2.597	
Skewness	4.605	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test
Shapiro Wilk Test Statistic	0.398	Not Available
Shapiro Wilk Critical Value	0.929	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	816.9	95% H-UCL	N/A	
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)		
95% Student's-t UCL	816.9	95% Adjusted-CLT UCL (Chen 1995)		993.7
		95% Modified-t UCL (Johnson-1978)		846.2

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	1383	95% CLT UCL	805.8
		95% Jackknife UCL	816.9
		95% Standard Bootstrap UCL	800.7
		95% Bootstrap-t UCL	1763
		95% Hall's Bootstrap UCL	1988
		95% Percentile Bootstrap UCL	835
		95% BCA Bootstrap UCL	1135
		95% Chebyshev(Mean, Sd) UCL	1383
		97.5% Chebyshev(Mean, Sd) UCL	1784
		99% Chebyshev(Mean, Sd) UCL	2572

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	0.439	Minimum of Log Data	-0.823
Maximum	136	Maximum of Log Data	4.913
Mean	20.18	Mean of log Data	2.177
Median	20.18	SD of log Data	1.59
SD	26.12		
Coefficient of Variation	1.294		
Skewness	3.294		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.588	Shapiro Wilk Test Statistic	0.815
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	28.15	95% H-UCL	79.07
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	74.61
95% Adjusted-CLT UCL (Chen-1995)	30.87	97.5% Chebyshev (MVUE) UCL	94.47
95% Modified-t UCL (Johnson-1978)	28.61	99% Chebyshev (MVUE) UCL	133.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.678	Data do not follow a Discernable Distribution (0.05)	
Theta Star	29.79		
MLE of Mean	20.18		
MLE of Standard Deviation	24.52		
nu star	42.01		
Approximate Chi Square Value (.05)	28.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	27.9
Adjusted Chi Square Value	27.52	95% Jackknife UCL	28.15
		95% Standard Bootstrap UCL	27.64
Anderson-Darling Test Statistic	2.418	95% Bootstrap-t UCL	36.83
Anderson-Darling 5% Critical Value	0.79	95% Hall's Bootstrap UCL	67.1
Kolmogorov-Smirnov Test Statistic	0.299	95% Percentile Bootstrap UCL	27.98
Kolmogorov-Smirnov 5% Critical Value	0.164	95% BCA Bootstrap UCL	32.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.63
		97.5% Chebyshev(Mean, Sd) UCL	49.48
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	66.86
95% Approximate Gamma UCL	30.12		
95% Adjusted Gamma UCL	30.81		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	40.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.063	Minimum of Log Data	-2.765
Maximum	19.6	Maximum of Log Data	2.976
Mean	3.7	Mean of log Data	0.506
Median	3.7	SD of log Data	1.607
SD	4.335		
Coefficient of Variation	1.172		
Skewness	2.615		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.626	Shapiro Wilk Test Statistic	0.796
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.021	95% H-UCL	15.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.52
95% Adjusted-CLT UCL (Chen-1995)	5.371	97.5% Chebyshev (MVUE) UCL	18.41
95% Modified-t UCL (Johnson-1978)	5.082	99% Chebyshev (MVUE) UCL	26.04
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.696	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.314		
MLE of Mean	3.7		
MLE of Standard Deviation	4.434		
nu star	43.16		
Approximate Chi Square Value (.05)	29.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	4.98
Adjusted Chi Square Value	28.46	95% Jackknife UCL	5.021
		95% Standard Bootstrap UCL	4.961
Anderson-Darling Test Statistic	2.627	95% Bootstrap-t UCL	6.172
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	12.53
Kolmogorov-Smirnov Test Statistic	0.297	95% Percentile Bootstrap UCL	5.057
Kolmogorov-Smirnov 5% Critical Value	0.164	95% BCA Bootstrap UCL	5.418
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.093
		97.5% Chebyshev(Mean, Sd) UCL	8.562
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.45
95% Approximate Gamma UCL	5.488		
95% Adjusted Gamma UCL	5.612		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	7.093

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	3.85	Minimum of Log Data	1.348
Maximum	1340	Maximum of Log Data	7.2
Mean	197.9	Mean of log Data	4.408
Median	197.9	SD of log Data	1.67
SD	258.5		
Coefficient of Variation	1.306		
Skewness	3.286		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.586	Shapiro Wilk Test Statistic	0.805
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	276.7	95% H-UCL	912.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	812.7
95% Adjusted-CLT UCL (Chen-1995)	303.6	97.5% Chebyshev (MVUE) UCL	1034
95% Modified-t UCL (Johnson-1978)	281.3	99% Chebyshev (MVUE) UCL	1469

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.644	Data do not follow a Discernable Distribution (0.05)	
Theta Star	307.5		
MLE of Mean	197.9		
MLE of Standard Deviation	246.7		
nu star	39.9		
Approximate Chi Square Value (.05)	26.43	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	274.3
Adjusted Chi Square Value	25.82	95% Jackknife UCL	276.7
		95% Standard Bootstrap UCL	270.9
Anderson-Darling Test Statistic	2.464	95% Bootstrap-t UCL	369.4
Anderson-Darling 5% Critical Value	0.793	95% Hall's Bootstrap UCL	669.3
Kolmogorov-Smirnov Test Statistic	0.303	95% Percentile Bootstrap UCL	281
Kolmogorov-Smirnov 5% Critical Value	0.165	95% BCA Bootstrap UCL	319.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	400.3
		97.5% Chebyshev(Mean, Sd) UCL	487.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	659.9
95% Approximate Gamma UCL	298.8		
95% Adjusted Gamma UCL	305.9		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	400.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	31	Number of Distinct Observations	15

Raw Statistics		Log-transformed Statistics	
Minimum	15.3	Minimum of Log Data	2.728
Maximum	71.6	Maximum of Log Data	4.271
Mean	31.22	Mean of log Data	3.389
Median	31.22	SD of log Data	0.326
SD	10.91		
Coefficient of Variation	0.35		
Skewness	1.748		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.78	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.929	Shapiro Wilk Critical Value	0.929
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	34.55	95% H-UCL	34.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.32
95% Adjusted-CLT UCL (Chen-1995)	35.1	97.5% Chebyshev (MVUE) UCL	42.83
95% Modified-t UCL (Johnson-1978)	34.65	99% Chebyshev (MVUE) UCL	49.74

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.808	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.545		
MLE of Mean	31.22		
MLE of Standard Deviation	10.52		
nu star	546.1		
Approximate Chi Square Value (.05)	492.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0413	95% CLT UCL	34.45
Adjusted Chi Square Value	490.1	95% Jackknife UCL	34.55
		95% Standard Bootstrap UCL	34.48
Anderson-Darling Test Statistic	2.418	95% Bootstrap-t UCL	35.52
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	37.56
Kolmogorov-Smirnov Test Statistic	0.296	95% Percentile Bootstrap UCL	34.56
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	34.97
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.76
		97.5% Chebyshev(Mean, Sd) UCL	43.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	50.72
95% Approximate Gamma UCL	34.59		
95% Adjusted Gamma UCL	34.79		

Potential UCL to Use		
	Use 95% Student's-t UCL	34.55
	or 95% Modified-t UCL	34.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL. These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	567-03.wst	
Full Precision	OFF	
Confidence Coefficient		95%
Number of Bootstrap Operations		2000

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Chromium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	567-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11200	Minimum of Log Data	9.324
Maximum	13400	Maximum of Log Data	9.503
Mean	12300	Mean of log Data	9.417
Median	12300	SD of log Data	0.0366
SD	449.1		
Coefficient of Variation	0.0365		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12522	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12845
95% Adjusted-CLT UCL (Chen-1995)	12505	97.5% Chebyshev (MVUE) UCL	13081
95% Modified-t UCL (Johnson-1978)	12522	99% Chebyshev (MVUE) UCL	13544

Gamma Distribution Test		Data Distribution
k star (bias corrected)	622.8	Data do not follow a Discernable Distribution (0.05)
Theta Star	19.75	
MLE of Mean	12300	
MLE of Standard Deviation	492.9	
nu star	16194	
Approximate Chi Square Value (.05)	15899	Nonparametric Statistics
Adjusted Level of Significance	0.0301	95% CLT UCL 12505
Adjusted Chi Square Value	15857	95% Jackknife UCL 12522
		95% Standard Bootstrap UCL N/A
Anderson-Darling Test Statistic	3.075	95% Bootstrap-t UCL N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL N/A
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 12843
		97.5% Chebyshev(Mean, Sd) UCL 13078
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 13539
95% Approximate Gamma UCL	12528	
95% Adjusted Gamma UCL	12561	

Potential UCL to Use		
	Use 95% Student's-t UCL	12522
	or 95% Modified-t UCL	12522

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	6.8	Minimum of Log Data	1.917
Maximum	13.6	Maximum of Log Data	2.61
Mean	10.2	Mean of log Data	2.313
Median	10.2	SD of log Data	0.143
SD	1.388		
Coefficient of Variation	0.136		
Skewness	-3.40E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.561
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.89	95% H-UCL	11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.97
95% Adjusted-CLT UCL (Chen-1995)	10.83	97.5% Chebyshev (MVUE) UCL	12.74
95% Modified-t UCL (Johnson-1978)	10.89	99% Chebyshev (MVUE) UCL	14.25

Gamma Distribution Test		Data Distribution
k star (bias corrected)	42.63	Data do not follow a Discernable Distribution (0.05)
Theta Star	0.239	
MLE of Mean	10.2	
MLE of Standard Deviation	1.562	
nu star	1108	
Approximate Chi Square Value (.05)	1032	Nonparametric Statistics
Adjusted Level of Significance	0.0301	95% CLT UCL 10.83
Adjusted Chi Square Value	1022	95% Jackknife UCL 10.89
		95% Standard Bootstrap UCL N/A
Anderson-Darling Test Statistic	3.091	95% Bootstrap-t UCL N/A
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL N/A
Kolmogorov-Smirnov Test Statistic	0.441	95% Percentile Bootstrap UCL N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL 11.88
		97.5% Chebyshev(Mean, Sd) UCL 12.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL 14.03
95% Approximate Gamma UCL	10.95	
95% Adjusted Gamma UCL	11.07	

Potential UCL to Use		
	Use 95% Student's-t UCL	10.89
	or 95% Modified-t UCL	10.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.347	Minimum of Log Data	-1.058
Maximum	1.57	Maximum of Log Data	0.451
Mean	0.959	Mean of log Data	-0.0826
Median	0.959	SD of log Data	0.323
SD	0.25		
Coefficient of Variation	0.26		
Skewness	-3.16E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.521
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.082	95% H-UCL	1.162
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.348
95% Adjusted-CLT UCL (Chen-1995)	1.072	97.5% Chebyshev (MVUE) UCL	1.513
95% Modified-t UCL (Johnson-1978)	1.082	99% Chebyshev (MVUE) UCL	1.838

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.746	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0984		
MLE of Mean	0.959		
MLE of Standard Deviation	0.307		
nu star	253.4		
Approximate Chi Square Value (.05)	217.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	1.072
Adjusted Chi Square Value	212.8	95% Jackknife UCL	1.082
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.154	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.461	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.26
		97.5% Chebyshev(Mean, Sd) UCL	1.391
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.647
95% Approximate Gamma UCL	1.116		
95% Adjusted Gamma UCL	1.141		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.082
	or 95% Modified-t UCL	1.082

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	567-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Chromium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	567-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11200	Minimum of Log Data	9.324
Maximum	13400	Maximum of Log Data	9.503
Mean	12300	Mean of log Data	9.417
Median	12300	SD of log Data	0.0366
SD	449.1		
Coefficient of Variation	0.0365		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution		
95% Student's-t UCL	12522	95% H-UCL	N/A	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		12845
95% Adjusted-CLT UCL (Chen-1995)	12505	97.5% Chebyshev (MVUE) UCL		13081
95% Modified-t UCL (Johnson-1978)	12522	99% Chebyshev (MVUE) UCL		13544

Gamma Distribution Test		Data Distribution		
k star (bias corrected)	622.8	Data do not follow a Discernable Distribution (0.05)		
Theta Star	19.75			
MLE of Mean	12300			
MLE of Standard Deviation	492.9			
nu star	16194			
Approximate Chi Square Value (.05)	15899	Nonparametric Statistics		
Adjusted Level of Significance	0.0301	95% CLT UCL		12505
Adjusted Chi Square Value	15857	95% Jackknife UCL		12522
		95% Standard Bootstrap UCL	N/A	
Anderson-Darling Test Statistic	3.075	95% Bootstrap-t UCL	N/A	
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A	
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	N/A	
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A	
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		12843
		97.5% Chebyshev(Mean, Sd) UCL		13078
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		13539
95% Approximate Gamma UCL	12528			
95% Adjusted Gamma UCL	12561			

Potential UCL to Use		
	Use 95% Student's-t UCL	12522
	or 95% Modified-t UCL	12522

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	14.2	Minimum of Log Data	2.653
Maximum	17.7	Maximum of Log Data	2.874
Mean	15.95	Mean of log Data	2.769
Median	15.95	SD of log Data	0.045
SD	0.714		
Coefficient of Variation	0.0448		
Skewness	1.78E-14		

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.3	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.82
95% Adjusted-CLT UCL (Chen-1995)	16.28	97.5% Chebyshev (MVUE) UCL	17.19
95% Modified-t UCL (Johnson-1978)	16.3	99% Chebyshev (MVUE) UCL	17.93

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	413	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0386		
MLE of Mean	15.95		
MLE of Standard Deviation	0.785		
nu star	10739		
Approximate Chi Square Value (.05)	10499	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	16.28
Adjusted Chi Square Value	10465	95% Jackknife UCL	16.3
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.075	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.429	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.81
		97.5% Chebyshev(Mean, Sd) UCL	17.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.92
95% Approximate Gamma UCL	16.31		
95% Adjusted Gamma UCL	16.37		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.3
	or 95% Modified-t UCL	16.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.264	Minimum of Log Data	-1.332
Maximum	1.57	Maximum of Log Data	0.451
Mean	0.917	Mean of log Data	-0.141
Median	0.917	SD of log Data	0.387
SD	0.267		
Coefficient of Variation	0.291		
Skewness	1.44E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.507
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.049	95% H-UCL	1.169
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.373
95% Adjusted-CLT UCL (Chen-1995)	1.039	97.5% Chebyshev (MVUE) UCL	1.565
95% Modified-t UCL (Johnson-1978)	1.049	99% Chebyshev (MVUE) UCL	1.941

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.245	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.127		
MLE of Mean	0.917		
MLE of Standard Deviation	0.341		
nu star	188.4		
Approximate Chi Square Value (.05)	157.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	1.039
Adjusted Chi Square Value	153.6	95% Jackknife UCL	1.049
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.183	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.239
		97.5% Chebyshev(Mean, Sd) UCL	1.379
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.653
95% Approximate Gamma UCL	1.096		
95% Adjusted Gamma UCL	1.124		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.049
	or 95% Modified-t UCL	1.049

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	14-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Americium-241

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.003	Log Statistics Not Available
Maximum	1.65	
Mean	0.549	
Median	0.549	
SD	0.406	
Coefficient of Variation	0.74	
Skewness	1.625	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.651	Not Available	
Shapiro Wilk Critical Value	0.859		
Data not Normal at 5% Significance Level			

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.76	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.76	95% Adjusted-CLT UCL (Chen 1995)	0.801
		95% Modified-t UCL (Johnson-1978)	0.769

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	1.061	95% CLT UCL	0.742
		95% Jackknife UCL	0.76
		95% Standard Bootstrap UCL	0.737
		95% Bootstrap-t UCL	0.825
		95% Hall's Bootstrap UCL	1.838
		95% Percentile Bootstrap UCL	0.733
		95% BCA Bootstrap UCL	0.825
		95% Chebyshev(Mean, Sd) UCL	1.061
		97.5% Chebyshev(Mean, Sd) UCL	1.282
		99% Chebyshev(Mean, Sd) UCL	1.717

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.32	Minimum of Log Data	-1.139
Maximum	9.73	Maximum of Log Data	2.275
Mean	2.8	Mean of log Data	0.688
Median	2.8	SD of log Data	0.949
SD	2.414		
Coefficient of Variation	0.862		
Skewness	2.292		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.643	Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.051	95% H-UCL	7.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.752
95% Adjusted-CLT UCL (Chen-1995)	4.439	97.5% Chebyshev (MVUE) UCL	8.388
95% Modified-t UCL (Johnson-1978)	4.128	99% Chebyshev (MVUE) UCL	11.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.263	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.216		
MLE of Mean	2.8		
MLE of Standard Deviation	2.491		
nu star	30.32		
Approximate Chi Square Value (.05)	18.74	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	3.946
Adjusted Chi Square Value	17.37	95% Jackknife UCL	4.051
		95% Standard Bootstrap UCL	3.883
Anderson-Darling Test Statistic	1.496	95% Bootstrap-t UCL	4.748
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	9.263
Kolmogorov-Smirnov Test Statistic	0.355	95% Percentile Bootstrap UCL	3.955
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	4.343
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.837
		97.5% Chebyshev(Mean, Sd) UCL	7.151
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.733
95% Approximate Gamma UCL	4.529		
95% Adjusted Gamma UCL	4.888		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	5.837

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	4.1	Minimum of Log Data	1.411
Maximum	15.2	Maximum of Log Data	2.721
Mean	9.753	Mean of log Data	2.23
Median	10.18	SD of log Data	0.343
SD	2.883		
Coefficient of Variation	0.296		
Skewness	-0.223		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.905
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.25	95% H-UCL	12.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.09
95% Adjusted-CLT UCL (Chen-1995)	11.07	97.5% Chebyshev (MVUE) UCL	15.94
95% Modified-t UCL (Johnson-1978)	11.24	99% Chebyshev (MVUE) UCL	19.58
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.987	Data appear Normal at 5% Significance Level	
Theta Star	1.221		
MLE of Mean	9.753		
MLE of Standard Deviation	3.451		
nu star	191.7		
Approximate Chi Square Value (.05)	160.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.12
Adjusted Chi Square Value	156.3	95% Jackknife UCL	11.25
		95% Standard Bootstrap UCL	11.05
Anderson-Darling Test Statistic	0.416	95% Bootstrap-t UCL	11.1
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	11.22
Kolmogorov-Smirnov Test Statistic	0.175	95% Percentile Bootstrap UCL	11.01
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.38
		97.5% Chebyshev(Mean, Sd) UCL	14.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.03
95% Approximate Gamma UCL	11.64		
95% Adjusted Gamma UCL	11.96		
Potential UCL to Use		Use 95% Student's-t UCL	11.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.35	Minimum of Log Data	-1.05
Maximum	1.1	Maximum of Log Data	0.0953
Mean	0.591	Mean of log Data	-0.56
Median	0.591	SD of log Data	0.266
SD	0.179		
Coefficient of Variation	0.303		
Skewness	2.143		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.671	Shapiro Wilk Test Statistic	0.768
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.684	95% H-UCL	0.689
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.789
95% Adjusted-CLT UCL (Chen-1995)	0.71	97.5% Chebyshev (MVUE) UCL	0.875
95% Modified-t UCL (Johnson-1978)	0.689	99% Chebyshev (MVUE) UCL	1.044
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.99	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0538		
MLE of Mean	0.591		
MLE of Standard Deviation	0.178		
nu star	263.6		
Approximate Chi Square Value (.05)	227	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.676
Adjusted Chi Square Value	221.9	95% Jackknife UCL	0.684
		95% Standard Bootstrap UCL	0.67
Anderson-Darling Test Statistic	1.584	95% Bootstrap-t UCL	0.727
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	1.099
Kolmogorov-Smirnov Test Statistic	0.382	95% Percentile Bootstrap UCL	0.676
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.707
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.817
		97.5% Chebyshev(Mean, Sd) UCL	0.914
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.106
95% Approximate Gamma UCL	0.687		
95% Adjusted Gamma UCL	0.703		
Potential UCL to Use		Use 95% Student's-t UCL	0.684
		or 95% Modified-t UCL	0.689

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	12.7	Minimum of Log Data	2.542
Maximum	85	Maximum of Log Data	4.443
Mean	55.04	Mean of log Data	3.917
Median	54.47	SD of log Data	0.505
SD	20.43		
Coefficient of Variation	0.371		
Skewness	-0.314		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Test Statistic	0.814
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.63	95% H-UCL	79.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.09
95% Adjusted-CLT UCL (Chen-1995)	64.17	97.5% Chebyshev (MVUE) UCL	109
95% Modified-t UCL (Johnson-1978)	65.54	99% Chebyshev (MVUE) UCL	140.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.289	Data appear Normal at 5% Significance Level	
Theta Star	12.83		
MLE of Mean	55.04		
MLE of Standard Deviation	26.58		
nu star	102.9		
Approximate Chi Square Value (.05)	80.52	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.74
Adjusted Chi Square Value	77.5	95% Jackknife UCL	65.63
		95% Standard Bootstrap UCL	64.44
Anderson-Darling Test Statistic	0.495	95% Bootstrap-t UCL	65.64
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	65.29
Kolmogorov-Smirnov Test Statistic	0.197	95% Percentile Bootstrap UCL	64.59
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	64.17
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.75
		97.5% Chebyshev(Mean, Sd) UCL	91.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	113.7
95% Approximate Gamma UCL	70.36		
95% Adjusted Gamma UCL	73.1		
Potential UCL to Use		Use 95% Student's-t UCL	65.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt-60 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	13320	Minimum of Log Data	9.497
Maximum	80722	Maximum of Log Data	11.3
Mean	31242	Mean of log Data	10.21
Median	31245	SD of log Data	0.539
SD	18765		
Coefficient of Variation	0.601		
Skewness	1.738		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.813	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	40970	95% H-UCL	44841
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	52584
95% Adjusted-CLT UCL (Chen-1995)	43055	97.5% Chebyshev (MVUE) UCL	61924
95% Modified-t UCL (Johnson-1978)	41423	99% Chebyshev (MVUE) UCL	80272
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.861	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	10921		
MLE of Mean	31242		
MLE of Standard Deviation	18472		
nu star	68.66		
Approximate Chi Square Value (.05)	50.58	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	40152
Adjusted Chi Square Value	48.22	95% Jackknife UCL	40970
		95% Standard Bootstrap UCL	39753
Anderson-Darling Test Statistic	0.511	95% Bootstrap-t UCL	45664
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	81189
Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL	40267
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	42813
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	54853
		97.5% Chebyshev(Mean, Sd) UCL	65070
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	85139
95% Approximate Gamma UCL	42404		
95% Adjusted Gamma UCL	44480		
Potential UCL to Use		Use 95% Approximate Gamma UCL	42404

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	185	Minimum of Log Data	5.22
Maximum	1229	Maximum of Log Data	7.114
Mean	575.5	Mean of log Data	6.143
Median	396.1	SD of log Data	0.685
SD	387.9		
Coefficient of Variation	0.674		
Skewness	0.751		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.846	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	776.7	95% H-UCL	964.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1091
95% Adjusted-CLT UCL (Chen-1995)	785.7	97.5% Chebyshev (MVUE) UCL	1314
95% Modified-t UCL (Johnson-1978)	780.7	99% Chebyshev (MVUE) UCL	1753
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.934	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	297.6		
MLE of Mean	575.5		
MLE of Standard Deviation	413.8		
nu star	46.42		
Approximate Chi Square Value (.05)	31.79	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	759.7
Adjusted Chi Square Value	29.95	95% Jackknife UCL	776.7
		95% Standard Bootstrap UCL	754.9
Anderson-Darling Test Statistic	0.523	95% Bootstrap-t UCL	833.1
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	741
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	758.9
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	775.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1064
		97.5% Chebyshev(Mean, Sd) UCL	1275
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1690
95% Approximate Gamma UCL	840.5		
95% Adjusted Gamma UCL	892.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	840.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	0.273	Maximum of Log Data	-1.298
Mean	0.186	Mean of log Data	-1.805
Median	0.186	SD of log Data	0.679
SD	0.0614		
Coefficient of Variation	0.33		
Skewness	-1.62		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.656	Shapiro Wilk Test Statistic	0.474
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.218	95% H-UCL	0.337
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.382
95% Adjusted-CLT UCL (Chen-1995)	0.207	97.5% Chebyshev (MVUE) UCL	0.46
95% Modified-t UCL (Johnson-1978)	0.217	99% Chebyshev (MVUE) UCL	0.613
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.187	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0585		
MLE of Mean	0.186		
MLE of Standard Deviation	0.104		
nu star	76.5		
Approximate Chi Square Value (.05)	57.35	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.216
Adjusted Chi Square Value	54.83	95% Jackknife UCL	0.218
		95% Standard Bootstrap UCL	0.215
Anderson-Darling Test Statistic	2.686	95% Bootstrap-t UCL	0.212
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	0.209
Kolmogorov-Smirnov Test Statistic	0.482	95% Percentile Bootstrap UCL	0.214
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	0.207
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.264
		97.5% Chebyshev(Mean, Sd) UCL	0.297
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.363
95% Approximate Gamma UCL	0.249		
95% Adjusted Gamma UCL	0.26		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.264

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	1294	Maximum of Log Data	7.165
Mean	270.8	Mean of log Data	5.008
Median	95.92	SD of log Data	1.018
SD	372.6		
Coefficient of Variation	1.376		
Skewness	2.259		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.621	Shapiro Wilk Test Statistic	0.778
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	463.9	95% H-UCL	621.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	561.7
95% Adjusted-CLT UCL (Chen-1995)	522.6	97.5% Chebyshev (MVUE) UCL	702.3
95% Modified-t UCL (Johnson-1978)	475.6	99% Chebyshev (MVUE) UCL	978.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.788	Data do not follow a Discernable Distribution (0.05)	
Theta Star	343.7		
MLE of Mean	270.8		
MLE of Standard Deviation	305.1		
nu star	18.91		
Approximate Chi Square Value (.05)	10.05	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	447.7
Adjusted Chi Square Value	9.078	95% Jackknife UCL	463.9
		95% Standard Bootstrap UCL	445.3
Anderson-Darling Test Statistic	1.558	95% Bootstrap-t UCL	679.4
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	522.7
Kolmogorov-Smirnov Test Statistic	0.357	95% Percentile Bootstrap UCL	454.2
Kolmogorov-Smirnov 5% Critical Value	0.253	95% BCA Bootstrap UCL	520.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	739.6
		97.5% Chebyshev(Mean, Sd) UCL	942.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1341
95% Approximate Gamma UCL	509.4		
95% Adjusted Gamma UCL	563.9		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	739.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.33	Minimum of Log Data	-1.109
Maximum	5	Maximum of Log Data	1.609
Mean	3.851	Mean of log Data	0.976
Median	5	SD of log Data	1.149
SD	2.079		
Coefficient of Variation	0.54		
Skewness	-1.328		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.558	Shapiro Wilk Test Statistic	0.573
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.929	95% H-UCL	15.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.14
95% Adjusted-CLT UCL (Chen-1995)	4.592	97.5% Chebyshev (MVUE) UCL	15.35
95% Modified-t UCL (Johnson-1978)	4.89	99% Chebyshev (MVUE) UCL	21.64
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.172	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.285		
MLE of Mean	3.851		
MLE of Standard Deviation	3.557		
nu star	28.13		
Approximate Chi Square Value (.05)	17.03	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	4.838
Adjusted Chi Square Value	15.72	95% Jackknife UCL	4.929
		95% Standard Bootstrap UCL	4.763
Anderson-Darling Test Statistic	2.853	95% Bootstrap-t UCL	4.829
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	4.656
Kolmogorov-Smirnov Test Statistic	0.477	95% Percentile Bootstrap UCL	4.615
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	4.615
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.467
		97.5% Chebyshev(Mean, Sd) UCL	7.599
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.823
95% Approximate Gamma UCL	6.361		
95% Adjusted Gamma UCL	6.889		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.467
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	0.031	Minimum of Log Data	-3.474
Maximum	16.69	Maximum of Log Data	2.815
Mean	8.572	Mean of log Data	1.296
Median	10	SD of log Data	2.257
SD	5.102		
Coefficient of Variation	0.595		
Skewness	-0.709		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.826	Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.22	95% H-UCL	2004
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	111.9
95% Adjusted-CLT UCL (Chen-1995)	10.67	97.5% Chebyshev (MVUE) UCL	148.3
95% Modified-t UCL (Johnson-1978)	11.17	99% Chebyshev (MVUE) UCL	219.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.586	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.62		
MLE of Mean	8.572		
MLE of Standard Deviation	11.19		
nu star	14.08		
Approximate Chi Square Value (.05)	6.623	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.99
Adjusted Chi Square Value	5.86	95% Jackknife UCL	11.22
		95% Standard Bootstrap UCL	10.9
Anderson-Darling Test Statistic	2.234	95% Bootstrap-t UCL	10.83
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	10.64
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	10.84
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	10.48
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.99
		97.5% Chebyshev(Mean, Sd) UCL	17.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.23
95% Approximate Gamma UCL	18.22		
95% Adjusted Gamma UCL	20.59		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	23.23
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.75	Minimum of Log Data	-0.288
Maximum	406	Maximum of Log Data	6.006
Mean	137.6	Mean of log Data	4.322
Median	137.6	SD of log Data	1.748
SD	99.1		
Coefficient of Variation	0.72		
Skewness	1.624		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.653	Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	189	95% H-UCL	3561
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	921.2
95% Adjusted-CLT UCL (Chen-1995)	199	97.5% Chebyshev (MVUE) UCL	1203
95% Modified-t UCL (Johnson-1978)	191.3	99% Chebyshev (MVUE) UCL	1756
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.777	Data do not follow a Discernable Distribution (0.05)	
Theta Star	177.1		
MLE of Mean	137.6		
MLE of Standard Deviation	156.2		
nu star	18.65		
Approximate Chi Square Value (.05)	9.861	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	184.7
Adjusted Chi Square Value	8.9	95% Jackknife UCL	189
		95% Standard Bootstrap UCL	183.7
Anderson-Darling Test Statistic	2.366	95% Bootstrap-t UCL	204.7
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	452
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	182.4
Kolmogorov-Smirnov 5% Critical Value	0.253	95% BCA Bootstrap UCL	193.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	262.3
		97.5% Chebyshev(Mean, Sd) UCL	316.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	422.3
95% Approximate Gamma UCL	260.3		
95% Adjusted Gamma UCL	288.4		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	422.3
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	6.86	Minimum of Log Data	1.926
Maximum	352.3	Maximum of Log Data	5.865
Mean	90.07	Mean of log Data	3.5
Median	22.1	SD of log Data	1.429
SD	132.2		
Coefficient of Variation	1.467		
Skewness	1.457		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.65	Shapiro Wilk Test Statistic	0.847
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	158.6	95% H-UCL	462.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	236.4
95% Adjusted-CLT UCL (Chen-1995)	170	97.5% Chebyshev (MVUE) UCL	304.1
95% Modified-t UCL (Johnson-1978)	161.3	99% Chebyshev (MVUE) UCL	437.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.517	Data do not follow a Discernable Distribution (0.05)	
Theta Star	174.2		
MLE of Mean	90.07		
MLE of Standard Deviation	125.3		
nu star	12.41		
Approximate Chi Square Value (.05)	5.498	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	152.8
Adjusted Chi Square Value	4.814	95% Jackknife UCL	158.6
		95% Standard Bootstrap UCL	150.3
Anderson-Darling Test Statistic	1.256	95% Bootstrap-t UCL	205
Anderson-Darling 5% Critical Value	0.776	95% Hall's Bootstrap UCL	138.2
Kolmogorov-Smirnov Test Statistic	0.296	95% Percentile Bootstrap UCL	155.4
Kolmogorov-Smirnov 5% Critical Value	0.257	95% BCA Bootstrap UCL	170.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	256.4
		97.5% Chebyshev(Mean, Sd) UCL	328.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	469.7
95% Approximate Gamma UCL	203.3		
95% Adjusted Gamma UCL	232.2		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	256.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0113	Minimum of Log Data	-4.483
Maximum	0.287	Maximum of Log Data	-1.248
Mean	0.12	Mean of log Data	-2.302
Median	0.12	SD of log Data	0.763
SD	0.0627		
Coefficient of Variation	0.523		
Skewness	1.418		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.673	Shapiro Wilk Test Statistic	0.622
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.152	95% H-UCL	0.238
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.261
95% Adjusted-CLT UCL (Chen-1995)	0.157	97.5% Chebyshev (MVUE) UCL	0.317
95% Modified-t UCL (Johnson-1978)	0.153	99% Chebyshev (MVUE) UCL	0.428

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.255	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0531		
MLE of Mean	0.12		
MLE of Standard Deviation	0.0798		
nu star	54.11		
Approximate Chi Square Value (.05)	38.21	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.15
Adjusted Chi Square Value	36.18	95% Jackknife UCL	0.152
		95% Standard Bootstrap UCL	0.149
Anderson-Darling Test Statistic	2.09	95% Bootstrap-t UCL	0.16
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	0.329
Kolmogorov-Smirnov Test Statistic	0.411	95% Percentile Bootstrap UCL	0.153
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	0.157
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.199
		97.5% Chebyshev(Mean, Sd) UCL	0.233
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.3
95% Approximate Gamma UCL	0.17		
95% Adjusted Gamma UCL	0.179		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.199

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.121	Minimum of Log Data	-2.112
Maximum	9.14	Maximum of Log Data	2.213
Mean	3.65	Mean of log Data	1.023
Median	3.65	SD of log Data	1.051
SD	2.055		
Coefficient of Variation	0.563		
Skewness	1.433		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.673	Shapiro Wilk Test Statistic	0.566
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.715	95% H-UCL	12.55
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.97
95% Adjusted-CLT UCL (Chen-1995)	4.888	97.5% Chebyshev (MVUE) UCL	13.76
95% Modified-t UCL (Johnson-1978)	4.756	99% Chebyshev (MVUE) UCL	19.23

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.549	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.356		
MLE of Mean	3.65		
MLE of Standard Deviation	2.933		
nu star	37.18		
Approximate Chi Square Value (.05)	24.22	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	4.626
Adjusted Chi Square Value	22.64	95% Jackknife UCL	4.715
		95% Standard Bootstrap UCL	4.607
Anderson-Darling Test Statistic	2.213	95% Bootstrap-t UCL	4.962
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	10.48
Kolmogorov-Smirnov Test Statistic	0.428	95% Percentile Bootstrap UCL	4.696
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	4.859
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.236
		97.5% Chebyshev(Mean, Sd) UCL	7.354
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.552
95% Approximate Gamma UCL	5.603		
95% Adjusted Gamma UCL	5.996		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	6.236

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	6.75	Minimum of Log Data	1.91
Maximum	50.2	Maximum of Log Data	3.916
Mean	25.01	Mean of log Data	3.143
Median	25.01	SD of log Data	0.445
SD	9.505		
Coefficient of Variation	0.38		
Skewness	1.243		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.672	Shapiro Wilk Test Statistic	0.647
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	29.94	95% H-UCL	33.82
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.85
95% Adjusted-CLT UCL (Chen-1995)	30.58	97.5% Chebyshev (MVUE) UCL	46.12
95% Modified-t UCL (Johnson-1978)	30.1	99% Chebyshev (MVUE) UCL	58.43
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.105	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.899		
MLE of Mean	25.01		
MLE of Standard Deviation	11.07		
nu star	122.5		
Approximate Chi Square Value (.05)	97.97	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	29.53
Adjusted Chi Square Value	94.62	95% Jackknife UCL	29.94
		95% Standard Bootstrap UCL	29.35
Anderson-Darling Test Statistic	2.053	95% Bootstrap-t UCL	30.89
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	56.61
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	29.42
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	29.79
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	36.97
		97.5% Chebyshev(Mean, Sd) UCL	42.15
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	52.31
95% Approximate Gamma UCL	31.28		
95% Adjusted Gamma UCL	32.39		
Potential UCL to Use		Use 95% Student's-t UCL	29.94
		or 95% Modified-t UCL	30.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	14-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	5190	Minimum of Log Data	8.554
Maximum	13100	Maximum of Log Data	9.48
Mean	9145	Mean of log Data	9.104
Median	9145	SD of log Data	0.201
SD	1686		
Coefficient of Variation	0.184		
Skewness	0		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.576
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10019	95% H-UCL	10260
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11488
95% Adjusted-CLT UCL (Chen-1995)	9946	97.5% Chebyshev (MVUE) UCL	12497
95% Modified-t UCL (Johnson-1978)	10019	99% Chebyshev (MVUE) UCL	14478

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	21.91	Data do not follow a Discernable Distribution (0.05)	
Theta Star	417.4		
MLE of Mean	9145		
MLE of Standard Deviation	1954		
nu star	525.9		
Approximate Chi Square Value (.05)	473.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9946
Adjusted Chi Square Value	466.1	95% Jackknife UCL	10019
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.746	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.441	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11267
		97.5% Chebyshev(Mean, Sd) UCL	12185
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13989
95% Approximate Gamma UCL	10152		
95% Adjusted Gamma UCL	10317		

Potential UCL to Use		
	Use 95% Student's-t UCL	10019
	or 95% Modified-t UCL	10019

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	3.2	Minimum of Log Data	1.163
Maximum	3.7	Maximum of Log Data	1.308
Mean	3.45	Mean of log Data	1.238
Median	3.45	SD of log Data	0.031
SD	0.107		
Coefficient of Variation	0.0309		
Skewness	-2E-14		

Warning: There are only 3 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.505	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.584
95% Adjusted-CLT UCL (Chen-1995)	3.501	97.5% Chebyshev (MVUE) UCL	3.643
95% Modified-t UCL (Johnson-1978)	3.505	99% Chebyshev (MVUE) UCL	3.757

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	854.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00404		
MLE of Mean	3.45		
MLE of Standard Deviation	0.118		
nu star	20518		
Approximate Chi Square Value (.05)	20186	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	3.501
Adjusted Chi Square Value	20135	95% Jackknife UCL	3.505
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.419	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.584
		97.5% Chebyshev(Mean, Sd) UCL	3.642
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.756
95% Approximate Gamma UCL	3.507		
95% Adjusted Gamma UCL	3.516		

Potential UCL to Use		
	Use 95% Student's-t UCL	3.505
	or 95% Modified-t UCL	3.505

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	6.38	Minimum of Log Data	1.853
Maximum	25.82	Maximum of Log Data	3.251
Mean	11.48	Mean of log Data	2.348
Median	9.34	SD of log Data	0.431
SD	5.736		
Coefficient of Variation	0.5		
Skewness	1.622		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.817	Shapiro Wilk Test Statistic	0.912
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.46	95% H-UCL	15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.67
95% Adjusted-CLT UCL (Chen-1995)	15.04	97.5% Chebyshev (MVUE) UCL	20.38
95% Modified-t UCL (Johnson-1978)	14.59	99% Chebyshev (MVUE) UCL	25.72
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.203	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2.732		
MLE of Mean	11.48		
MLE of Standard Deviation	5.601		
nu star	100.9		
Approximate Chi Square Value (.05)	78.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	14.21
Adjusted Chi Square Value	75.72	95% Jackknife UCL	14.46
		95% Standard Bootstrap UCL	14.07
Anderson-Darling Test Statistic	0.569	95% Bootstrap-t UCL	16.41
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	16.57
Kolmogorov-Smirnov Test Statistic	0.22	95% Percentile Bootstrap UCL	14.31
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	14.92
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.7
		97.5% Chebyshev(Mean, Sd) UCL	21.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27.96
95% Approximate Gamma UCL	14.72		
95% Adjusted Gamma UCL	15.3		
Potential UCL to Use		Use 95% Approximate Gamma UCL	14.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.62	Minimum of Log Data	-0.478
Maximum	0.71	Maximum of Log Data	-0.342
Mean	0.665	Mean of log Data	-0.408
Median	0.665	SD of log Data	0.0289
SD	0.0192		
Coefficient of Variation	0.0289		
Skewness	-1E-14		

Warning: There are only 3 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.675	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.689
95% Adjusted-CLT UCL (Chen-1995)	0.674	97.5% Chebyshev (MVUE) UCL	0.7
95% Modified-t UCL (Johnson-1978)	0.675	99% Chebyshev (MVUE) UCL	0.72

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	980.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00068		
MLE of Mean	0.665		
MLE of Standard Deviation	0.0212		
nu star	23536		
Approximate Chi Square Value (.05)	23180	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.674
Adjusted Chi Square Value	23126	95% Jackknife UCL	0.675
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.714	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.689
		97.5% Chebyshev(Mean, Sd) UCL	0.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.72
95% Approximate Gamma UCL	0.675		
95% Adjusted Gamma UCL	0.677		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.675
		or 95% Modified-t UCL	0.675

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.73	Minimum of Log Data	-0.315
Maximum	2.4	Maximum of Log Data	0.875
Mean	1.565	Mean of log Data	0.42
Median	1.565	SD of log Data	0.262
SD	0.356		
Coefficient of Variation	0.228		
Skewness	-2E-15		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.562
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.75	95% H-UCL	1.829
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.092
95% Adjusted-CLT UCL (Chen-1995)	1.734	97.5% Chebyshev (MVUE) UCL	2.317
95% Modified-t UCL (Johnson-1978)	1.75	99% Chebyshev (MVUE) UCL	2.761
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.61	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.115		
MLE of Mean	1.565		
MLE of Standard Deviation	0.424		
nu star	326.7		
Approximate Chi Square Value (.05)	285.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.734
Adjusted Chi Square Value	280	95% Jackknife UCL	1.75
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.766	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.448	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.013
		97.5% Chebyshev(Mean, Sd) UCL	2.207
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.588
95% Approximate Gamma UCL	1.789		
95% Adjusted Gamma UCL	1.826		
Potential UCL to Use		Use 95% Student's-t UCL	1.75
		or 95% Modified-t UCL	1.75

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	36.91	Minimum of Log Data	3.608
Maximum	98.88	Maximum of Log Data	4.594
Mean	61.28	Mean of log Data	4.059
Median	60.16	SD of log Data	0.353
SD	21.36		
Coefficient of Variation	0.348		
Skewness	0.387		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.35	95% H-UCL	76.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88.85
95% Adjusted-CLT UCL (Chen-1995)	72.16	97.5% Chebyshev (MVUE) UCL	100.8
95% Modified-t UCL (Johnson-1978)	72.47	99% Chebyshev (MVUE) UCL	124.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.812	Data appear Normal at 5% Significance Level	
Theta Star	8.997		
MLE of Mean	61.28		
MLE of Standard Deviation	23.48		
nu star	163.5		
Approximate Chi Square Value (.05)	134.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	71.42
Adjusted Chi Square Value	131	95% Jackknife UCL	72.35
		95% Standard Bootstrap UCL	71.31
Anderson-Darling Test Statistic	0.424	95% Bootstrap-t UCL	73.75
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	70.97
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	71.21
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	71.31
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.15
		97.5% Chebyshev(Mean, Sd) UCL	99.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	122.6
95% Approximate Gamma UCL	74.26		
95% Adjusted Gamma UCL	76.5		
Potential UCL to Use		Use 95% Student's-t UCL	72.35

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	24.29	Minimum of Log Data	3.19
Maximum	258.3	Maximum of Log Data	5.554
Mean	149.4	Mean of log Data	4.763
Median	159.2	SD of log Data	0.848
SD	82.42		
Coefficient of Variation	0.552		
Skewness	-0.4		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.916	Shapiro Wilk Test Statistic	0.804
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	192.1	95% H-UCL	330.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	343.4
95% Adjusted-CLT UCL (Chen-1995)	185.6	97.5% Chebyshev (MVUE) UCL	422.2
95% Modified-t UCL (Johnson-1978)	191.7	99% Chebyshev (MVUE) UCL	576.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.709	Data appear Normal at 5% Significance Level	
Theta Star	87.4		
MLE of Mean	149.4		
MLE of Standard Deviation	114.3		
nu star	41.02		
Approximate Chi Square Value (.05)	27.34	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	188.5
Adjusted Chi Square Value	25.65	95% Jackknife UCL	192.1
		95% Standard Bootstrap UCL	187.5
Anderson-Darling Test Statistic	0.831	95% Bootstrap-t UCL	188.6
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	184.8
Kolmogorov-Smirnov Test Statistic	0.239	95% Percentile Bootstrap UCL	187.2
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	189.2
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	253.1
		97.5% Chebyshev(Mean, Sd) UCL	298
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	386.1
95% Approximate Gamma UCL	224.1		
95% Adjusted Gamma UCL	238.9		
Potential UCL to Use		Use 95% Student's-t UCL	192.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	22763	Minimum of Log Data	10.03
Maximum	61312	Maximum of Log Data	11.02
Mean	37892	Mean of log Data	10.5
Median	36336	SD of log Data	0.289
SD	11330		
Coefficient of Variation	0.299		
Skewness	0.817		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.944	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	43766	95% H-UCL	44921
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51770
95% Adjusted-CLT UCL (Chen-1995)	44096	97.5% Chebyshev (MVUE) UCL	57787
95% Modified-t UCL (Johnson-1978)	43894	99% Chebyshev (MVUE) UCL	69606
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.788	Data appear Normal at 5% Significance Level	
Theta Star	3871		
MLE of Mean	37892		
MLE of Standard Deviation	12111		
nu star	234.9		
Approximate Chi Square Value (.05)	200.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	43272
Adjusted Chi Square Value	195.6	95% Jackknife UCL	43766
		95% Standard Bootstrap UCL	42914
Anderson-Darling Test Statistic	0.2	95% Bootstrap-t UCL	45608
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	44676
Kolmogorov-Smirnov Test Statistic	0.124	95% Percentile Bootstrap UCL	43218
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	43811
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	52149
		97.5% Chebyshev(Mean, Sd) UCL	58318
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	70436
95% Approximate Gamma UCL	44410		
95% Adjusted Gamma UCL	45514		
Potential UCL to Use		Use 95% Student's-t UCL	43766

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	250.4	Minimum of Log Data	5.523
Maximum	2668	Maximum of Log Data	7.889
Mean	1110	Mean of log Data	6.789
Median	931.5	SD of log Data	0.716
SD	769.1		
Coefficient of Variation	0.693		
Skewness	1.056		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.888	Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1509	95% H-UCL	1941
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2169
95% Adjusted-CLT UCL (Chen-1995)	1548	97.5% Chebyshev (MVUE) UCL	2623
95% Modified-t UCL (Johnson-1978)	1520	99% Chebyshev (MVUE) UCL	3516
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.847	Data appear Normal at 5% Significance Level	
Theta Star	601.2		
MLE of Mean	1110		
MLE of Standard Deviation	817.1		
nu star	44.33		
Approximate Chi Square Value (.05)	30.06	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1476
Adjusted Chi Square Value	28.27	95% Jackknife UCL	1509
		95% Standard Bootstrap UCL	1467
Anderson-Darling Test Statistic	0.205	95% Bootstrap-t UCL	1679
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	1790
Kolmogorov-Smirnov Test Statistic	0.128	95% Percentile Bootstrap UCL	1455
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	1496
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2078
		97.5% Chebyshev(Mean, Sd) UCL	2497
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3320
95% Approximate Gamma UCL	1638		
95% Adjusted Gamma UCL	1741		
Potential UCL to Use		Use 95% Student's-t UCL	1509

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.267	Minimum of Log Data	-1.321
Maximum	10	Maximum of Log Data	2.303
Mean	8.3	Mean of log Data	1.732
Median	10	SD of log Data	1.31
SD	3.724		
Coefficient of Variation	0.449		
Skewness	-2.024		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.504	Shapiro Wilk Test Statistic	0.491
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.23	95% H-UCL	53.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.29
95% Adjusted-CLT UCL (Chen-1995)	9.397	97.5% Chebyshev (MVUE) UCL	42.55
95% Modified-t UCL (Johnson-1978)	10.13	99% Chebyshev (MVUE) UCL	60.72
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.139	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.286		
MLE of Mean	8.3		
MLE of Standard Deviation	7.776		
nu star	27.34		
Approximate Chi Square Value (.05)	16.41	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.07
Adjusted Chi Square Value	15.13	95% Jackknife UCL	10.23
		95% Standard Bootstrap UCL	9.964
Anderson-Darling Test Statistic	3.348	95% Bootstrap-t UCL	9.662
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	9.472
Kolmogorov-Smirnov Test Statistic	0.474	95% Percentile Bootstrap UCL	9.907
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	9.204
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.99
		97.5% Chebyshev(Mean, Sd) UCL	15.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19
95% Approximate Gamma UCL	13.82		
95% Adjusted Gamma UCL	14.99		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.99
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.77	Minimum of Log Data	-0.261
Maximum	2.29	Maximum of Log Data	0.829
Mean	1.53	Mean of log Data	0.402
Median	1.53	SD of log Data	0.239
SD	0.324		
Coefficient of Variation	0.212		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.568
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.698	95% H-UCL	1.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.997
95% Adjusted-CLT UCL (Chen-1995)	1.684	97.5% Chebyshev (MVUE) UCL	2.198
95% Modified-t UCL (Johnson-1978)	1.698	99% Chebyshev (MVUE) UCL	2.592
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	16.06	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0953		
MLE of Mean	1.53		
MLE of Standard Deviation	0.382		
nu star	385.5		
Approximate Chi Square Value (.05)	341	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.684
Adjusted Chi Square Value	334.6	95% Jackknife UCL	1.698
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.758	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.445	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.938
		97.5% Chebyshev(Mean, Sd) UCL	2.114
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.461
95% Approximate Gamma UCL	1.73		
95% Adjusted Gamma UCL	1.763		
Potential UCL to Use		Use 95% Student's-t UCL	1.698
		or 95% Modified-t UCL	1.698

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	260.6	Minimum of Log Data	5.563
Maximum	1381	Maximum of Log Data	7.231
Mean	607.1	Mean of log Data	6.25
Median	407.8	SD of log Data	0.582
SD	364		
Coefficient of Variation	0.6		
Skewness	0.912		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	795.8	95% H-UCL	910
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1060
95% Adjusted-CLT UCL (Chen-1995)	809.5	97.5% Chebyshev (MVUE) UCL	1257
95% Modified-t UCL (Johnson-1978)	800.4	99% Chebyshev (MVUE) UCL	1644
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.543	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	238.7		
MLE of Mean	607.1		
MLE of Standard Deviation	380.7		
nu star	61.04		
Approximate Chi Square Value (.05)	44.07	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	779.9
Adjusted Chi Square Value	41.88	95% Jackknife UCL	795.8
		95% Standard Bootstrap UCL	775.9
Anderson-Darling Test Statistic	0.762	95% Bootstrap-t UCL	823.9
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	796.4
Kolmogorov-Smirnov Test Statistic	0.236	95% Percentile Bootstrap UCL	781.1
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	795.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1065
		97.5% Chebyshev(Mean, Sd) UCL	1263
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1653
95% Approximate Gamma UCL	840.8		
95% Adjusted Gamma UCL	884.8		
Potential UCL to Use		Use 95% Approximate Gamma UCL	840.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.39	Minimum of Log Data	-0.942
Maximum	5	Maximum of Log Data	1.609
Mean	4.591	Mean of log Data	1.392
Median	5	SD of log Data	0.735
SD	1.326		
Coefficient of Variation	0.289		
Skewness	-3.439		

Warning: There are only 3 Distinct Values in this data
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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.356	Shapiro Wilk Test Statistic	0.338
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.278	95% H-UCL	9.103
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.09
95% Adjusted-CLT UCL (Chen-1995)	4.814	97.5% Chebyshev (MVUE) UCL	12.23
95% Modified-t UCL (Johnson-1978)	5.215	99% Chebyshev (MVUE) UCL	16.45

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.008	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.526		
MLE of Mean	4.591		
MLE of Standard Deviation	2.647		
nu star	72.19		
Approximate Chi Square Value (.05)	53.62	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.22
Adjusted Chi Square Value	51.19	95% Jackknife UCL	5.278
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.001	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.502	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.259
		97.5% Chebyshev(Mean, Sd) UCL	6.981
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.399
95% Approximate Gamma UCL	6.18		
95% Adjusted Gamma UCL	6.474		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.259
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.5	Minimum of Log Data	0.405
Maximum	30.65	Maximum of Log Data	3.423
Mean	19.35	Mean of log Data	2.815
Median	20	SD of log Data	0.769
SD	6.4		
Coefficient of Variation	0.331		
Skewness	-1.763		

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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.565	Shapiro Wilk Test Statistic	0.42
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	22.66	95% H-UCL	40.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	43.87
95% Adjusted-CLT UCL (Chen-1995)	21.38	97.5% Chebyshev (MVUE) UCL	53.43
95% Modified-t UCL (Johnson-1978)	22.51	99% Chebyshev (MVUE) UCL	72.21
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.725	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.1		
MLE of Mean	19.35		
MLE of Standard Deviation	11.72		
nu star	65.39		
Approximate Chi Square Value (.05)	47.79	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	22.38
Adjusted Chi Square Value	45.5	95% Jackknife UCL	22.66
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.285	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.512	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	27.4
		97.5% Chebyshev(Mean, Sd) UCL	30.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	37.73
95% Approximate Gamma UCL	26.47		
95% Adjusted Gamma UCL	27.81		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	27.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.72	Minimum of Log Data	-0.329
Maximum	10	Maximum of Log Data	2.303
Mean	8.458	Mean of log Data	1.903
Median	10	SD of log Data	0.93
SD	3.506		
Coefficient of Variation	0.415		
Skewness	-2.054		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.486	Shapiro Wilk Test Statistic	0.489
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.28	95% H-UCL	22.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.11
95% Adjusted-CLT UCL (Chen-1995)	9.482	97.5% Chebyshev (MVUE) UCL	27.41
95% Modified-t UCL (Johnson-1978)	10.18	99% Chebyshev (MVUE) UCL	37.83
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.786	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.736		
MLE of Mean	8.458		
MLE of Standard Deviation	6.329		
nu star	42.86		
Approximate Chi Square Value (.05)	28.85	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.12
Adjusted Chi Square Value	27.11	95% Jackknife UCL	10.28
		95% Standard Bootstrap UCL	10.05
Anderson-Darling Test Statistic	3.342	95% Bootstrap-t UCL	9.686
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	9.513
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	9.93
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	9.267
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.87
		97.5% Chebyshev(Mean, Sd) UCL	14.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.53
95% Approximate Gamma UCL	12.57		
95% Adjusted Gamma UCL	13.37		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.87
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	5.98	Minimum of Log Data	1.788
Maximum	8.8	Maximum of Log Data	2.175
Mean	7.39	Mean of log Data	1.997
Median	7.39	SD of log Data	0.0827
SD	0.601		
Coefficient of Variation	0.0814		
Skewness	2.2E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.595
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.702	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.16
95% Adjusted-CLT UCL (Chen-1995)	7.675	97.5% Chebyshev (MVUE) UCL	8.493
95% Modified-t UCL (Johnson-1978)	7.702	99% Chebyshev (MVUE) UCL	9.147
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	121.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0608		
MLE of Mean	7.39		
MLE of Standard Deviation	0.67		
nu star	2917		
Approximate Chi Square Value (.05)	2792	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	7.675
Adjusted Chi Square Value	2774	95% Jackknife UCL	7.702
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.72	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.147
		97.5% Chebyshev(Mean, Sd) UCL	8.474
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.117
95% Approximate Gamma UCL	7.719		
95% Adjusted Gamma UCL	7.771		
Potential UCL to Use		Use 95% Student's-t UCL	7.702
		or 95% Modified-t UCL	7.702

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0639	Minimum of Log Data	-2.75
Maximum	0.338	Maximum of Log Data	-1.084
Mean	0.201	Mean of log Data	-1.656
Median	0.201	SD of log Data	0.375
SD	0.0585		
Coefficient of Variation	0.291		
Skewness	1.7E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.536
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.231	95% H-UCL	0.257
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.301
95% Adjusted-CLT UCL (Chen-1995)	0.229	97.5% Chebyshev (MVUE) UCL	0.343
95% Modified-t UCL (Johnson-1978)	0.231	99% Chebyshev (MVUE) UCL	0.426
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.372	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0273		
MLE of Mean	0.201		
MLE of Standard Deviation	0.074		
nu star	176.9		
Approximate Chi Square Value (.05)	147.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.229
Adjusted Chi Square Value	143	95% Jackknife UCL	0.231
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.812	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.459	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.275
		97.5% Chebyshev(Mean, Sd) UCL	0.306
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.369
95% Approximate Gamma UCL	0.242		
95% Adjusted Gamma UCL	0.249		
Potential UCL to Use		Use 95% Student's-t UCL	0.231
		or 95% Modified-t UCL	0.231

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	21.54	Minimum of Log Data	3.07
Maximum	524.2	Maximum of Log Data	6.262
Mean	269.2	Mean of log Data	5.237
Median	316.9	SD of log Data	1.027
SD	183.4		
Coefficient of Variation	0.681		
Skewness	-0.0757		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.864
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	364.3	95% H-UCL	797.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	715.3
95% Adjusted-CLT UCL (Chen-1995)	355.1	97.5% Chebyshev (MVUE) UCL	895
95% Modified-t UCL (Johnson-1978)	364.1	99% Chebyshev (MVUE) UCL	1248
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.211	Data appear Normal at 5% Significance Level	
Theta Star	222.3		
MLE of Mean	269.2		
MLE of Standard Deviation	244.6		
nu star	29.07		
Approximate Chi Square Value (.05)	17.76	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	356.3
Adjusted Chi Square Value	16.43	95% Jackknife UCL	364.3
		95% Standard Bootstrap UCL	350
Anderson-Darling Test Statistic	0.692	95% Bootstrap-t UCL	364.8
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	346.8
Kolmogorov-Smirnov Test Statistic	0.255	95% Percentile Bootstrap UCL	359.1
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	352.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	500
		97.5% Chebyshev(Mean, Sd) UCL	599.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	796
95% Approximate Gamma UCL	440.6		
95% Adjusted Gamma UCL	476.5		
Potential UCL to Use		Use 95% Student's-t UCL	364.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	32.4	Minimum of Log Data	3.478
Maximum	58.1	Maximum of Log Data	4.062
Mean	45.25	Mean of log Data	3.805
Median	45.25	SD of log Data	0.126
SD	5.479		
Coefficient of Variation	0.121		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.589
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	48.09	95% H-UCL	48.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	52.42
95% Adjusted-CLT UCL (Chen-1995)	47.85	97.5% Chebyshev (MVUE) UCL	55.52
95% Modified-t UCL (Johnson-1978)	48.09	99% Chebyshev (MVUE) UCL	61.61
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	53.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.843		
MLE of Mean	45.25		
MLE of Standard Deviation	6.175		
nu star	1289		
Approximate Chi Square Value (.05)	1206	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	47.85
Adjusted Chi Square Value	1194	95% Jackknife UCL	48.09
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.727	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.432	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	52.14
		97.5% Chebyshev(Mean, Sd) UCL	55.13
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	60.99
95% Approximate Gamma UCL	48.34		
95% Adjusted Gamma UCL	48.83		
Potential UCL to Use		Use 95% Student's-t UCL	48.09
		or 95% Modified-t UCL	48.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	2	Minimum of Log Data	0.693
Maximum	4.31	Maximum of Log Data	1.461
Mean	3.155	Mean of log Data	1.137
Median	3.155	SD of log Data	0.166
SD	0.492		
Coefficient of Variation	0.156		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.582
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3.41	95% H-UCL	3.462
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.819
95% Adjusted-CLT UCL (Chen-1995)	3.389	97.5% Chebyshev (MVUE) UCL	4.105
95% Modified-t UCL (Johnson-1978)	3.41	99% Chebyshev (MVUE) UCL	4.667
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	31.45	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.1		
MLE of Mean	3.155		
MLE of Standard Deviation	0.563		
nu star	754.9		
Approximate Chi Square Value (.05)	692.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	3.389
Adjusted Chi Square Value	683	95% Jackknife UCL	3.41
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.736	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.437	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.775
		97.5% Chebyshev(Mean, Sd) UCL	4.043
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.57
95% Approximate Gamma UCL	3.441		
95% Adjusted Gamma UCL	3.487		
Potential UCL to Use		Use 95% Student's-t UCL	3.41
		or 95% Modified-t UCL	3.41

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	56.1	Minimum of Log Data	4.027
Maximum	111	Maximum of Log Data	4.71
Mean	83.55	Mean of log Data	4.416
Median	83.55	SD of log Data	0.147
SD	11.7		
Coefficient of Variation	0.14		
Skewness	5.4E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.586
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	89.62	95% H-UCL	90.64
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.1
95% Adjusted-CLT UCL (Chen-1995)	89.11	97.5% Chebyshev (MVUE) UCL	105.8
95% Modified-t UCL (Johnson-1978)	89.62	99% Chebyshev (MVUE) UCL	119
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	39.58	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.111		
MLE of Mean	83.55		
MLE of Standard Deviation	13.28		
nu star	949.8		
Approximate Chi Square Value (.05)	879.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	89.11
Adjusted Chi Square Value	868.9	95% Jackknife UCL	89.62
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.731	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.435	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.28
		97.5% Chebyshev(Mean, Sd) UCL	104.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	117.2
95% Approximate Gamma UCL	90.25		
95% Adjusted Gamma UCL	91.33		
Potential UCL to Use		Use 95% Student's-t UCL	89.62
		or 95% Modified-t UCL	89.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options			
From File			14-03.wst
Full Precision			OFF
Confidence Coefficient			95%
Number of Bootstrap Operations			2000

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	6.95	Minimum of Log Data	1.939
Maximum	44.8	Maximum of Log Data	3.802
Mean	13.77	Mean of log Data	2.465
Median	10.47	SD of log Data	0.526
SD	10.37		
Coefficient of Variation	0.753		
Skewness	2.809		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.633	Shapiro Wilk Test Statistic	0.859
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.14	95% H-UCL	19.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.38
95% Adjusted-CLT UCL (Chen-1995)	21.28	97.5% Chebyshev (MVUE) UCL	26.3
95% Modified-t UCL (Johnson-1978)	19.55	99% Chebyshev (MVUE) UCL	33.99
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.556	ata Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.386		
MLE of Mean	13.77		
MLE of Standard Deviation	8.611		
nu star	61.35		
Approximate Chi Square Value (.05)	44.33	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	18.69
Adjusted Chi Square Value	42.13	95% Jackknife UCL	19.14
		95% Standard Bootstrap UCL	18.55
Anderson-Darling Test Statistic	0.849	95% Bootstrap-t UCL	26.68
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	37.34
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	19.18
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	21.6
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.82
		97.5% Chebyshev(Mean, Sd) UCL	32.46
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.55
95% Approximate Gamma UCL	19.05		
95% Adjusted Gamma UCL	20.05		
Potential UCL to Use		Use 95% Approximate Gamma UCL	19.05

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.62	Minimum of Log Data	-0.478
Maximum	3	Maximum of Log Data	1.099
Mean	1.81	Mean of log Data	0.546
Median	1.81	SD of log Data	0.354
SD	0.507		
Coefficient of Variation	0.28		
Skewness	7.42E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.541
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.073	95% H-UCL	2.27
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.652
95% Adjusted-CLT UCL (Chen-1995)	2.051	97.5% Chebyshev (MVUE) UCL	3.008
95% Modified-t UCL (Johnson-1978)	2.073	99% Chebyshev (MVUE) UCL	3.709

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.128	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.223		
MLE of Mean	1.81		
MLE of Standard Deviation	0.635		
nu star	195.1		
Approximate Chi Square Value (.05)	163.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	2.051
Adjusted Chi Square Value	159.4	95% Jackknife UCL	2.073
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.802	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.448
		97.5% Chebyshev(Mean, Sd) UCL	2.725
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.267
95% Approximate Gamma UCL	2.156		
95% Adjusted Gamma UCL	2.215		

Potential UCL to Use		
	Use 95% Student's-t UCL	2.073
	or 95% Modified-t UCL	2.073

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	25	Minimum of Log Data	3.219
Maximum	85	Maximum of Log Data	4.443
Mean	59.59	Mean of log Data	4.018
Median	63.2	SD of log Data	0.411
SD	21.04		
Coefficient of Variation	0.353		
Skewness	-0.338		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Test Statistic	0.887
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.5	95% H-UCL	77.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	91.62
95% Adjusted-CLT UCL (Chen-1995)	68.95	97.5% Chebyshev (MVUE) UCL	105.3
95% Modified-t UCL (Johnson-1978)	70.4	99% Chebyshev (MVUE) UCL	132.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.563	Data appear Normal at 5% Significance Level	
Theta Star	10.71		
MLE of Mean	59.59		
MLE of Standard Deviation	25.27		
nu star	133.5		
Approximate Chi Square Value (.05)	107.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	69.58
Adjusted Chi Square Value	104.3	95% Jackknife UCL	70.5
		95% Standard Bootstrap UCL	68.91
Anderson-Darling Test Statistic	0.502	95% Bootstrap-t UCL	69.38
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	68.63
Kolmogorov-Smirnov Test Statistic	0.19	95% Percentile Bootstrap UCL	68.84
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	68.84
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.07
		97.5% Chebyshev(Mean, Sd) UCL	97.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	120
95% Approximate Gamma UCL	73.79		
95% Adjusted Gamma UCL	76.28		
Potential UCL to Use		Use 95% Student's-t UCL	70.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	11.5	Minimum of Log Data	2.442
Maximum	19.3	Maximum of Log Data	2.96
Mean	15.4	Mean of log Data	2.729
Median	15.4	SD of log Data	0.111
SD	1.663		
Coefficient of Variation	0.108		
Skewness	-7.75E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.591
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.26	95% H-UCL	16.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.56
95% Adjusted-CLT UCL (Chen-1995)	16.19	97.5% Chebyshev (MVUE) UCL	18.49
95% Modified-t UCL (Johnson-1978)	16.26	99% Chebyshev (MVUE) UCL	20.33
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	68.07	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.226		
MLE of Mean	15.4		
MLE of Standard Deviation	1.867		
nu star	1634		
Approximate Chi Square Value (.05)	1541	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	16.19
Adjusted Chi Square Value	1527	95% Jackknife UCL	16.26
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.724	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.49
		97.5% Chebyshev(Mean, Sd) UCL	18.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.18
95% Approximate Gamma UCL	16.33		
95% Adjusted Gamma UCL	16.48		
Potential UCL to Use		Use 95% Student's-t UCL	16.26
		or 95% Modified-t UCL	16.26

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	23.3	Minimum of Log Data	3.148
Maximum	195.6	Maximum of Log Data	5.276
Mean	100	Mean of log Data	4.406
Median	92.48	SD of log Data	0.722
SD	57.09		
Coefficient of Variation	0.571		
Skewness	0.246		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	129.6	95% H-UCL	181.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	201.9
95% Adjusted-CLT UCL (Chen-1995)	128.4	97.5% Chebyshev (MVUE) UCL	244.4
95% Modified-t UCL (Johnson-1978)	129.8	99% Chebyshev (MVUE) UCL	327.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.053	Data appear Normal at 5% Significance Level	
Theta Star	48.73		
MLE of Mean	100		
MLE of Standard Deviation	69.82		
nu star	49.27		
Approximate Chi Square Value (.05)	34.15	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	127.1
Adjusted Chi Square Value	32.24	95% Jackknife UCL	129.6
		95% Standard Bootstrap UCL	126.2
Anderson-Darling Test Statistic	0.474	95% Bootstrap-t UCL	132.8
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	129.6
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	125.8
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	127.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	171.9
		97.5% Chebyshev(Mean, Sd) UCL	203
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	264
95% Approximate Gamma UCL	144.3		
95% Adjusted Gamma UCL	152.9		
Potential UCL to Use		Use 95% Student's-t UCL	129.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	18071	Minimum of Log Data	9.802
Maximum	92700	Maximum of Log Data	11.44
Mean	35611	Mean of log Data	10.37
Median	27135	SD of log Data	0.444
SD	20449		
Coefficient of Variation	0.574		
Skewness	2.308		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.722	Shapiro Wilk Test Statistic	0.888
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	46212	95% H-UCL	46651
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54971
95% Adjusted-CLT UCL (Chen-1995)	49524	97.5% Chebyshev (MVUE) UCL	63595
95% Modified-t UCL (Johnson-1978)	46868	99% Chebyshev (MVUE) UCL	80535
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.723 ata Follow Appr. Gamma Distribution at 5% Significance Level		
Theta Star	9564		
MLE of Mean	35611		
MLE of Standard Deviation	18455		
nu star	89.36		
Approximate Chi Square Value (.05)	68.56	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	45320
Adjusted Chi Square Value	65.79	95% Jackknife UCL	46212
		95% Standard Bootstrap UCL	44826
Anderson-Darling Test Statistic	0.815	95% Bootstrap-t UCL	62648
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	90761
Kolmogorov-Smirnov Test Statistic	0.237	95% Percentile Bootstrap UCL	45929
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	49203
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	61342
		97.5% Chebyshev(Mean, Sd) UCL	72475
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	94345
95% Approximate Gamma UCL	46412		
95% Adjusted Gamma UCL	48369		
Potential UCL to Use		Use 95% Approximate Gamma UCL	46412

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	382.8	Minimum of Log Data	5.947
Maximum	1854	Maximum of Log Data	7.525
Mean	992.1	Mean of log Data	6.795
Median	773.3	SD of log Data	0.483
SD	470		
Coefficient of Variation	0.474		
Skewness	0.606		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.905	Shapiro Wilk Test Statistic	0.947
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1236	95% H-UCL	1368
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1611
95% Adjusted-CLT UCL (Chen-1995)	1241	97.5% Chebyshev (MVUE) UCL	1878
95% Modified-t UCL (Johnson-1978)	1240	99% Chebyshev (MVUE) UCL	2403
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.755	Data appear Normal at 5% Significance Level	
Theta Star	264.2		
MLE of Mean	992.1		
MLE of Standard Deviation	512		
nu star	90.13		
Approximate Chi Square Value (.05)	69.24	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1215
Adjusted Chi Square Value	66.45	95% Jackknife UCL	1236
		95% Standard Bootstrap UCL	1204
Anderson-Darling Test Statistic	0.441	95% Bootstrap-t UCL	1273
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	1218
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	1204
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	1223
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1583
		97.5% Chebyshev(Mean, Sd) UCL	1839
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2342
95% Approximate Gamma UCL	1291		
95% Adjusted Gamma UCL	1346		
Potential UCL to Use		Use 95% Student's-t UCL	1236

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0548	Minimum of Log Data	-2.904
Maximum	10	Maximum of Log Data	2.303
Mean	8.961	Mean of log Data	1.845
Median	10	SD of log Data	1.498
SD	2.897		
Coefficient of Variation	0.323		
Skewness	-3.135		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.428	Shapiro Wilk Test Statistic	0.352
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.46	95% H-UCL	112.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	50.56
95% Adjusted-CLT UCL (Chen-1995)	9.528	97.5% Chebyshev (MVUE) UCL	65.3
95% Modified-t UCL (Johnson-1978)	10.34	99% Chebyshev (MVUE) UCL	94.25

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.241	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.218		
MLE of Mean	8.961		
MLE of Standard Deviation	8.043		
nu star	29.79		
Approximate Chi Square Value (.05)	18.33	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.34
Adjusted Chi Square Value	16.97	95% Jackknife UCL	10.46
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.912	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.491	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.61
		97.5% Chebyshev(Mean, Sd) UCL	14.18
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.28
95% Approximate Gamma UCL	14.56		
95% Adjusted Gamma UCL	15.73		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.61

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Molybdenum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	2.8	Minimum of Log Data	1.03
Maximum	28.67	Maximum of Log Data	3.356
Mean	14.15	Mean of log Data	2.496
Median	15	SD of log Data	0.674
SD	6.494		
Coefficient of Variation	0.459		
Skewness	0.132		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.703	Shapiro Wilk Test Statistic	0.633
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.51	95% H-UCL	24.66
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.01
95% Adjusted-CLT UCL (Chen-1995)	17.31	97.5% Chebyshev (MVUE) UCL	33.68
95% Modified-t UCL (Johnson-1978)	17.53	99% Chebyshev (MVUE) UCL	44.83

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.616	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.408		
MLE of Mean	14.15		
MLE of Standard Deviation	8.747		
nu star	62.78		
Approximate Chi Square Value (.05)	45.56	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	17.23
Adjusted Chi Square Value	43.32	95% Jackknife UCL	17.51
		95% Standard Bootstrap UCL	17.14
Anderson-Darling Test Statistic	2.308	95% Bootstrap-t UCL	17.59
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	18.33
Kolmogorov-Smirnov Test Statistic	0.447	95% Percentile Bootstrap UCL	17.28
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	17.44
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.32
		97.5% Chebyshev(Mean, Sd) UCL	25.85
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.8
95% Approximate Gamma UCL	19.5		
95% Adjusted Gamma UCL	20.5		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	22.32

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.013	Minimum of Log Data	-4.343
Maximum	0.205	Maximum of Log Data	-1.585
Mean	0.109	Mean of log Data	-2.341
Median	0.109	SD of log Data	0.656
SD	0.0409		
Coefficient of Variation	0.376		
Skewness	5.17E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.482
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.13	95% H-UCL	0.19
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.217
95% Adjusted-CLT UCL (Chen-1995)	0.128	97.5% Chebyshev (MVUE) UCL	0.26
95% Modified-t UCL (Johnson-1978)	0.13	99% Chebyshev (MVUE) UCL	0.345

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.186	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0342		
MLE of Mean	0.109		
MLE of Standard Deviation	0.0611		
nu star	76.46		
Approximate Chi Square Value (.05)	57.32	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.128
Adjusted Chi Square Value	54.79	95% Jackknife UCL	0.13
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.949	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.482	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.161
		97.5% Chebyshev(Mean, Sd) UCL	0.183
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.227
95% Approximate Gamma UCL	0.145		
95% Adjusted Gamma UCL	0.152		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.161

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	64.57	Minimum of Log Data	4.168
Maximum	1198	Maximum of Log Data	7.089
Mean	395	Mean of log Data	5.581
Median	248.4	SD of log Data	0.972
SD	354.3		
Coefficient of Variation	0.897		
Skewness	1.23		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	578.7	95% H-UCL	985.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	930.9
95% Adjusted-CLT UCL (Chen-1995)	602	97.5% Chebyshev (MVUE) UCL	1159
95% Modified-t UCL (Johnson-1978)	584.7	99% Chebyshev (MVUE) UCL	1607
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.107	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	356.9		
MLE of Mean	395		
MLE of Standard Deviation	375.5		
nu star	26.56		
Approximate Chi Square Value (.05)	15.81	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	563.2
Adjusted Chi Square Value	14.56	95% Jackknife UCL	578.7
		95% Standard Bootstrap UCL	552.8
Anderson-Darling Test Statistic	0.308	95% Bootstrap-t UCL	656
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	602.7
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	567
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	621.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	840.9
		97.5% Chebyshev(Mean, Sd) UCL	1034
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1413
95% Approximate Gamma UCL	663.5		
95% Adjusted Gamma UCL	720.6		
Potential UCL to Use		Use 95% Approximate Gamma UCL	663.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.065	Minimum of Log Data	-2.733
Maximum	10	Maximum of Log Data	2.303
Mean	5.035	Mean of log Data	1.141
Median	5	SD of log Data	1.485
SD	2.954		
Coefficient of Variation	0.587		
Skewness	0.0818		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.779	Shapiro Wilk Test Statistic	0.618
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.566	95% H-UCL	53.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.52
95% Adjusted-CLT UCL (Chen-1995)	6.459	97.5% Chebyshev (MVUE) UCL	31.64
95% Modified-t UCL (Johnson-1978)	6.569	99% Chebyshev (MVUE) UCL	45.64
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.95	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.302		
MLE of Mean	5.035		
MLE of Standard Deviation	5.167		
nu star	22.79		
Approximate Chi Square Value (.05)	12.93	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.437
Adjusted Chi Square Value	11.81	95% Jackknife UCL	6.566
		95% Standard Bootstrap UCL	6.372
Anderson-Darling Test Statistic	2.032	95% Bootstrap-t UCL	6.713
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	6.922
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	6.285
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	6.279
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.751
		97.5% Chebyshev(Mean, Sd) UCL	10.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.52
95% Approximate Gamma UCL	8.872		
95% Adjusted Gamma UCL	9.714		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.751

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.028	Minimum of Log Data	-3.576
Maximum	13.41	Maximum of Log Data	2.596
Mean	8.623	Mean of log Data	1.377
Median	10	SD of log Data	2.233
SD	4.129		
Coefficient of Variation	0.479		
Skewness	-1.758		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.604	Shapiro Wilk Test Statistic	0.496
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.76	95% H-UCL	1909
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116
95% Adjusted-CLT UCL (Chen-1995)	9.937	97.5% Chebyshev (MVUE) UCL	153.7
95% Modified-t UCL (Johnson-1978)	10.66	99% Chebyshev (MVUE) UCL	227.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.631	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.66		
MLE of Mean	8.623		
MLE of Standard Deviation	10.85		
nu star	15.15		
Approximate Chi Square Value (.05)	7.367	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.58
Adjusted Chi Square Value	6.555	95% Jackknife UCL	10.76
		95% Standard Bootstrap UCL	10.46
Anderson-Darling Test Statistic	3.44	95% Bootstrap-t UCL	10.26
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	10.07
Kolmogorov-Smirnov Test Statistic	0.53	95% Percentile Bootstrap UCL	10.28
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	10.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.82
		97.5% Chebyshev(Mean, Sd) UCL	16.07
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.48
95% Approximate Gamma UCL	17.74		
95% Adjusted Gamma UCL	19.93		

Potential UCL to Use			
		Use 99% Chebyshev (Mean, Sd) UCL	20.48

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	349.2	Maximum of Log Data	5.856
Mean	83.16	Mean of log Data	3.752
Median	33.96	SD of log Data	1.191
SD	107.6		
Coefficient of Variation	1.294		
Skewness	1.781		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.922
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	139	95% H-UCL	280.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	207.9
95% Adjusted-CLT UCL (Chen-1995)	151.3	97.5% Chebyshev (MVUE) UCL	263.6
95% Modified-t UCL (Johnson-1978)	141.6	99% Chebyshev (MVUE) UCL	372.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.713	Data appear Lognormal at 5% Significance Level	
Theta Star	116.6		
MLE of Mean	83.16		
MLE of Standard Deviation	98.46		
nu star	17.12		
Approximate Chi Square Value (.05)	8.758	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	134.3
Adjusted Chi Square Value	7.861	95% Jackknife UCL	139
		95% Standard Bootstrap UCL	131.7
Anderson-Darling Test Statistic	0.948	95% Bootstrap-t UCL	176.1
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	129.4
Kolmogorov-Smirnov Test Statistic	0.324	95% Percentile Bootstrap UCL	136.2
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	151.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	218.6
		97.5% Chebyshev(Mean, Sd) UCL	277.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	392.3
95% Approximate Gamma UCL	162.6		
95% Adjusted Gamma UCL	181.1		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	218.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	1	Minimum of Log Data	0
Maximum	6.61	Maximum of Log Data	1.889
Mean	3.805	Mean of log Data	1.271
Median	3.805	SD of log Data	0.431
SD	1.196		
Coefficient of Variation	0.314		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.524
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.425	95% H-UCL	5.109
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.018
95% Adjusted-CLT UCL (Chen-1995)	4.373	97.5% Chebyshev (MVUE) UCL	6.943
95% Modified-t UCL (Johnson-1978)	4.425	99% Chebyshev (MVUE) UCL	8.762
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.917	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.643		
MLE of Mean	3.805		
MLE of Standard Deviation	1.564		
nu star	142		
Approximate Chi Square Value (.05)	115.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	4.373
Adjusted Chi Square Value	111.8	95% Jackknife UCL	4.425
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.837	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.31
		97.5% Chebyshev(Mean, Sd) UCL	5.961
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.24
95% Approximate Gamma UCL	4.679		
95% Adjusted Gamma UCL	4.832		
Potential UCL to Use		Use 95% Student's-t UCL	4.425
		or 95% Modified-t UCL	4.425

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.052	Minimum of Log Data	-2.957
Maximum	0.37	Maximum of Log Data	-0.994
Mean	0.211	Mean of log Data	-1.626
Median	0.211	SD of log Data	0.449
SD	0.0678		
Coefficient of Variation	0.321		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.52
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.246	95% H-UCL	0.288
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.34
95% Adjusted-CLT UCL (Chen-1995)	0.243	97.5% Chebyshev (MVUE) UCL	0.394
95% Modified-t UCL (Johnson-1978)	0.246	99% Chebyshev (MVUE) UCL	0.499

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.541	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0381		
MLE of Mean	0.211		
MLE of Standard Deviation	0.0896		
nu star	133		
Approximate Chi Square Value (.05)	107.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.243
Adjusted Chi Square Value	103.8	95% Jackknife UCL	0.246
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.846	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.466	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.296
		97.5% Chebyshev(Mean, Sd) UCL	0.333
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.406
95% Approximate Gamma UCL	0.261		
95% Adjusted Gamma UCL	0.27		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.246
	or 95% Modified-t UCL	0.246

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.5	Minimum of Log Data	0.405
Maximum	13.6	Maximum of Log Data	2.61
Mean	7.55	Mean of log Data	1.936
Median	7.55	SD of log Data	0.511
SD	2.58		
Coefficient of Variation	0.342		
Skewness	2.35E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.508
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.887	95% H-UCL	11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.94
95% Adjusted-CLT UCL (Chen-1995)	8.775	97.5% Chebyshev (MVUE) UCL	15.16
95% Modified-t UCL (Johnson-1978)	8.887	99% Chebyshev (MVUE) UCL	19.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.556	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.657		
MLE of Mean	7.55		
MLE of Standard Deviation	3.537		
nu star	109.3		
Approximate Chi Square Value (.05)	86.21	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	8.775
Adjusted Chi Square Value	83.08	95% Jackknife UCL	8.887
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.876	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.8
		97.5% Chebyshev(Mean, Sd) UCL	12.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.96
95% Approximate Gamma UCL	9.576		
95% Adjusted Gamma UCL	9.937		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	10.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	23.9	Minimum of Log Data	3.174
Maximum	86.2	Maximum of Log Data	4.457
Mean	55.05	Mean of log Data	3.976
Median	55.05	SD of log Data	0.284
SD	13.28		
Coefficient of Variation	0.241		
Skewness	2.88E-15		

Warning: There are only 3 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.557
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	61.94	95% H-UCL	65.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	75.2
95% Adjusted-CLT UCL (Chen-1995)	61.36	97.5% Chebyshev (MVUE) UCL	83.81
95% Modified-t UCL (Johnson-1978)	61.94	99% Chebyshev (MVUE) UCL	100.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.84	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.65		
MLE of Mean	55.05		
MLE of Standard Deviation	16		
nu star	284.1		
Approximate Chi Square Value (.05)	246.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	61.36
Adjusted Chi Square Value	240.7	95% Jackknife UCL	61.94
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.774	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	71.76
		97.5% Chebyshev(Mean, Sd) UCL	79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	93.2
95% Approximate Gamma UCL	63.56		
95% Adjusted Gamma UCL	64.99		

Potential UCL to Use		
	Use 95% Student's-t UCL	61.94
	or 95% Modified-t UCL	61.94

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	11300	Minimum of Log Data	9.333
Maximum	12100	Maximum of Log Data	9.401
Mean	11700	Mean of log Data	9.367
Median	11700	SD of log Data	0.014
SD	163.3		
Coefficient of Variation	0.014		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11781	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11898
95% Adjusted-CLT UCL (Chen-1995)	11774	97.5% Chebyshev (MVUE) UCL	11983
95% Modified-t UCL (Johnson-1978)	11781	99% Chebyshev (MVUE) UCL	12151

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4275	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.737		
MLE of Mean	11700		
MLE of Standard Deviation	178.9		
nu star	111163		
Approximate Chi Square Value (.05)	110388	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	11774
Adjusted Chi Square Value	110278	95% Jackknife UCL	11781
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.415	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.51	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11897
		97.5% Chebyshev(Mean, Sd) UCL	11983
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12151
95% Approximate Gamma UCL	11782		
95% Adjusted Gamma UCL	11794		

Potential UCL to Use		
	Use 95% Student's-t UCL	11781
	or 95% Modified-t UCL	11781

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.3	Minimum of Log Data	-1.204
Maximum	4.3	Maximum of Log Data	1.459
Mean	2.3	Mean of log Data	0.724
Median	2.3	SD of log Data	0.605
SD	0.816		
Coefficient of Variation	0.355		
Skewness	-1.9E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.464
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.704	95% H-UCL	3.663
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.285
95% Adjusted-CLT UCL (Chen-1995)	2.672	97.5% Chebyshev (MVUE) UCL	5.084
95% Modified-t UCL (Johnson-1978)	2.704	99% Chebyshev (MVUE) UCL	6.654
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.718	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.619		
MLE of Mean	2.3		
MLE of Standard Deviation	1.193		
nu star	96.66		
Approximate Chi Square Value (.05)	74.98	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	2.672
Adjusted Chi Square Value	72.27	95% Jackknife UCL	2.704
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.295	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.484	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.287
		97.5% Chebyshev(Mean, Sd) UCL	3.714
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.553
95% Approximate Gamma UCL	2.965		
95% Adjusted Gamma UCL	3.076		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.287

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	5.9	Minimum of Log Data	1.775
Maximum	20.75	Maximum of Log Data	3.033
Mean	10.45	Mean of log Data	2.295
Median	9.8	SD of log Data	0.324
SD	3.84		
Coefficient of Variation	0.367		
Skewness	1.74		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.35	95% H-UCL	12.53
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.54
95% Adjusted-CLT UCL (Chen-1995)	12.76	97.5% Chebyshev (MVUE) UCL	16.33
95% Modified-t UCL (Johnson-1978)	12.44	99% Chebyshev (MVUE) UCL	19.83
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.581	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.379		
MLE of Mean	10.45		
MLE of Standard Deviation	3.797		
nu star	197.1		
Approximate Chi Square Value (.05)	165.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	12.21
Adjusted Chi Square Value	161.5	95% Jackknife UCL	12.35
		95% Standard Bootstrap UCL	12.11
Anderson-Darling Test Statistic	0.46	95% Bootstrap-t UCL	13.51
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	22.14
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	12.22
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	12.87
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.1
		97.5% Chebyshev(Mean, Sd) UCL	17.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.05
95% Approximate Gamma UCL	12.44		
95% Adjusted Gamma UCL	12.76		
Potential UCL to Use		Use 95% Approximate Gamma UCL	12.44

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	18.7	Minimum of Log Data	2.929
Maximum	85	Maximum of Log Data	4.443
Mean	47.5	Mean of log Data	3.792
Median	41.59	SD of log Data	0.394
SD	18.31		
Coefficient of Variation	0.386		
Skewness	0.792		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.929	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	56.55	95% H-UCL	60.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	70.66
95% Adjusted-CLT UCL (Chen-1995)	57.05	97.5% Chebyshev (MVUE) UCL	80.63
95% Modified-t UCL (Johnson-1978)	56.74	99% Chebyshev (MVUE) UCL	100.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.738	Data appear Normal at 5% Significance Level	
Theta Star	8.277		
MLE of Mean	47.5		
MLE of Standard Deviation	19.83		
nu star	149.2		
Approximate Chi Square Value (.05)	122	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	55.85
Adjusted Chi Square Value	118.5	95% Jackknife UCL	56.55
		95% Standard Bootstrap UCL	55.54
Anderson-Darling Test Statistic	0.306	95% Bootstrap-t UCL	59.17
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	60.82
Kolmogorov-Smirnov Test Statistic	0.157	95% Percentile Bootstrap UCL	55.91
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	57.43
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	69.64
		97.5% Chebyshev(Mean, Sd) UCL	79.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	98.04
95% Approximate Gamma UCL	58.1		
95% Adjusted Gamma UCL	59.82		
Potential UCL to Use		Use 95% Student's-t UCL	56.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	13.9	Minimum of Log Data	2.632
Maximum	15.1	Maximum of Log Data	2.715
Mean	14.5	Mean of log Data	2.674
Median	14.5	SD of log Data	0.0169
SD	0.245		
Coefficient of Variation	0.0169		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	14.62	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.8
95% Adjusted-CLT UCL (Chen-1995)	14.61	97.5% Chebyshev (MVUE) UCL	14.92
95% Modified-t UCL (Johnson-1978)	14.62	99% Chebyshev (MVUE) UCL	15.18
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2918	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00497		
MLE of Mean	14.5		
MLE of Standard Deviation	0.268		
nu star	75863		
Approximate Chi Square Value (.05)	75224	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	14.61
Adjusted Chi Square Value	75133	95% Jackknife UCL	14.62
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.183	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.473	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.8
		97.5% Chebyshev(Mean, Sd) UCL	14.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.18
95% Approximate Gamma UCL	14.62		
95% Adjusted Gamma UCL	14.64		
Potential UCL to Use		Use 95% Student's-t UCL	14.62
		or 95% Modified-t UCL	14.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	29.72	Minimum of Log Data	3.392
Maximum	1099	Maximum of Log Data	7.002
Mean	211.2	Mean of log Data	4.888
Median	149.1	SD of log Data	0.934
SD	279.5		
Coefficient of Variation	1.323		
Skewness	3.07		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.587	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	349.4	95% H-UCL	428.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	433.3
95% Adjusted-CLT UCL (Chen-1995)	409.2	97.5% Chebyshev (MVUE) UCL	536
95% Modified-t UCL (Johnson-1978)	360.4	99% Chebyshev (MVUE) UCL	737.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.985	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	214.4		
MLE of Mean	211.2		
MLE of Standard Deviation	212.8		
nu star	25.61		
Approximate Chi Square Value (.05)	15.08	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	338.7
Adjusted Chi Square Value	13.94	95% Jackknife UCL	349.4
		95% Standard Bootstrap UCL	330.7
Anderson-Darling Test Statistic	0.611	95% Bootstrap-t UCL	618.7
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	848
Kolmogorov-Smirnov Test Statistic	0.19	95% Percentile Bootstrap UCL	350.1
Kolmogorov-Smirnov 5% Critical Value	0.242	95% BCA Bootstrap UCL	437.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	549.1
		97.5% Chebyshev(Mean, Sd) UCL	695.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	982.5
95% Approximate Gamma UCL	358.7		
95% Adjusted Gamma UCL	388.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	358.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	14880	Minimum of Log Data	9.608
Maximum	62968	Maximum of Log Data	11.05
Mean	32098	Mean of log Data	10.29
Median	32463	SD of log Data	0.426
SD	13660		
Coefficient of Variation	0.426		
Skewness	0.922		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	38850	95% H-UCL	41559
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49011
95% Adjusted-CLT UCL (Chen-1995)	39364	97.5% Chebyshev (MVUE) UCL	56315
95% Modified-t UCL (Johnson-1978)	39012	99% Chebyshev (MVUE) UCL	70662
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.847	Data appear Normal at 5% Significance Level	
Theta Star	6622		
MLE of Mean	32098		
MLE of Standard Deviation	14579		
nu star	126		
Approximate Chi Square Value (.05)	101.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	38330
Adjusted Chi Square Value	97.93	95% Jackknife UCL	38850
		95% Standard Bootstrap UCL	38010
Anderson-Darling Test Statistic	0.246	95% Bootstrap-t UCL	40899
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	43205
Kolmogorov-Smirnov Test Statistic	0.145	95% Percentile Bootstrap UCL	38220
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	39153
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48612
		97.5% Chebyshev(Mean, Sd) UCL	55758
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	69794
95% Approximate Gamma UCL	40012		
95% Adjusted Gamma UCL	41311		
Potential UCL to Use		Use 95% Student's-t UCL	38850

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	381.6	Minimum of Log Data	5.944
Maximum	1232	Maximum of Log Data	7.116
Mean	848.9	Mean of log Data	6.679
Median	869	SD of log Data	0.39
SD	296.7		
Coefficient of Variation	0.35		
Skewness	-0.156		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.924	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	995.6	95% H-UCL	1074
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1262
95% Adjusted-CLT UCL (Chen-1995)	980.4	97.5% Chebyshev (MVUE) UCL	1439
95% Modified-t UCL (Johnson-1978)	995	99% Chebyshev (MVUE) UCL	1786
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.093	Data appear Normal at 5% Significance Level	
Theta Star	139.3		
MLE of Mean	848.9		
MLE of Standard Deviation	343.9		
nu star	158.4		
Approximate Chi Square Value (.05)	130.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	984.2
Adjusted Chi Square Value	126.7	95% Jackknife UCL	995.6
		95% Standard Bootstrap UCL	980.4
Anderson-Darling Test Statistic	0.429	95% Bootstrap-t UCL	985.9
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	973.1
Kolmogorov-Smirnov Test Statistic	0.16	95% Percentile Bootstrap UCL	978.1
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	971.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1208
		97.5% Chebyshev(Mean, Sd) UCL	1363
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1668
95% Approximate Gamma UCL	1032		
95% Adjusted Gamma UCL	1061		
Potential UCL to Use		Use 95% Student's-t UCL	995.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0152	Minimum of Log Data	-4.186
Maximum	10	Maximum of Log Data	2.303
Mean	8.346	Mean of log Data	1.554
Median	10	SD of log Data	1.915
SD	3.636		
Coefficient of Variation	0.436		
Skewness	-2.087		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.51	Shapiro Wilk Test Statistic	0.468
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.14	95% H-UCL	374.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	78.05
95% Adjusted-CLT UCL (Chen-1995)	9.381	97.5% Chebyshev (MVUE) UCL	102.4
95% Modified-t UCL (Johnson-1978)	10.05	99% Chebyshev (MVUE) UCL	150.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.832	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.04		
MLE of Mean	8.346		
MLE of Standard Deviation	9.152		
nu star	21.62		
Approximate Chi Square Value (.05)	12.06	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.01
Adjusted Chi Square Value	11.05	95% Jackknife UCL	10.14
		95% Standard Bootstrap UCL	9.86
Anderson-Darling Test Statistic	3.63	95% Bootstrap-t UCL	9.687
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	9.492
Kolmogorov-Smirnov Test Statistic	0.467	95% Percentile Bootstrap UCL	9.692
Kolmogorov-Smirnov 5% Critical Value	0.243	95% BCA Bootstrap UCL	9.268
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.74
		97.5% Chebyshev(Mean, Sd) UCL	14.64
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.38
95% Approximate Gamma UCL	14.97		
95% Adjusted Gamma UCL	16.33		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) UCL	18.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.112	Minimum of Log Data	-2.189
Maximum	2.68	Maximum of Log Data	0.986
Mean	1.396	Mean of log Data	0.19
Median	1.396	SD of log Data	0.737
SD	0.524		
Coefficient of Variation	0.375		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.444
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.655	95% H-UCL	2.658
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.995
95% Adjusted-CLT UCL (Chen-1995)	1.635	97.5% Chebyshev (MVUE) UCL	3.621
95% Modified-t UCL (Johnson-1978)	1.655	99% Chebyshev (MVUE) UCL	4.852
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.846	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.491		
MLE of Mean	1.396		
MLE of Standard Deviation	0.828		
nu star	73.99		
Approximate Chi Square Value (.05)	55.18	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	1.635
Adjusted Chi Square Value	52.87	95% Jackknife UCL	1.655
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.367	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.03
		97.5% Chebyshev(Mean, Sd) UCL	2.304
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.843
95% Approximate Gamma UCL	1.872		
95% Adjusted Gamma UCL	1.954		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	2.03

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	151.2	Minimum of Log Data	5.018
Maximum	1591	Maximum of Log Data	7.372
Mean	504.9	Mean of log Data	5.998
Median	383	SD of log Data	0.675
SD	396.9		
Coefficient of Variation	0.786		
Skewness	1.918		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.795	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	701.1	95% H-UCL	797.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	917.6
95% Adjusted-CLT UCL (Chen-1995)	748.6	97.5% Chebyshev (MVUE) UCL	1100
95% Modified-t UCL (Johnson-1978)	710.9	99% Chebyshev (MVUE) UCL	1459
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.868	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	270.3		
MLE of Mean	504.9		
MLE of Standard Deviation	369.5		
nu star	48.56		
Approximate Chi Square Value (.05)	33.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	686
Adjusted Chi Square Value	31.8	95% Jackknife UCL	701.1
		95% Standard Bootstrap UCL	683.8
Anderson-Darling Test Statistic	0.386	95% Bootstrap-t UCL	843.3
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	1291
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	686
Kolmogorov-Smirnov 5% Critical Value	0.239	95% BCA Bootstrap UCL	772.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	984.8
		97.5% Chebyshev(Mean, Sd) UCL	1192
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1600
95% Approximate Gamma UCL	730.5		
95% Adjusted Gamma UCL	771.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	730.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.36	Minimum of Log Data	-1.022
Maximum	10	Maximum of Log Data	2.303
Mean	5.228	Mean of log Data	1.463
Median	5	SD of log Data	0.818
SD	2.527		
Coefficient of Variation	0.483		
Skewness	0.512		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.759	Shapiro Wilk Test Statistic	0.619
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.477	95% H-UCL	11.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.97
95% Adjusted-CLT UCL (Chen-1995)	6.487	97.5% Chebyshev (MVUE) UCL	14.62
95% Modified-t UCL (Johnson-1978)	6.493	99% Chebyshev (MVUE) UCL	19.83
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.189	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.388		
MLE of Mean	5.228		
MLE of Standard Deviation	3.533		
nu star	56.91		
Approximate Chi Square Value (.05)	40.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	6.38
Adjusted Chi Square Value	38.61	95% Jackknife UCL	6.477
		95% Standard Bootstrap UCL	6.374
Anderson-Darling Test Statistic	1.91	95% Bootstrap-t UCL	6.82
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	8.358
Kolmogorov-Smirnov Test Statistic	0.397	95% Percentile Bootstrap UCL	6.354
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	6.382
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.282
		97.5% Chebyshev(Mean, Sd) UCL	9.604
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.2
95% Approximate Gamma UCL	7.333		
95% Adjusted Gamma UCL	7.705		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.282

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	1.2	Minimum of Log Data	0.182
Maximum	11.7	Maximum of Log Data	2.46
Mean	9.582	Mean of log Data	2.164
Median	10	SD of log Data	0.597
SD	2.573		
Coefficient of Variation	0.269		
Skewness	-3.324		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.469	Shapiro Wilk Test Statistic	0.374
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.85	95% H-UCL	15.29
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.91
95% Adjusted-CLT UCL (Chen-1995)	10.05	97.5% Chebyshev (MVUE) UCL	21.22
95% Modified-t UCL (Johnson-1978)	10.74	99% Chebyshev (MVUE) UCL	27.73
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.181	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.291		
MLE of Mean	9.582		
MLE of Standard Deviation	4.686		
nu star	108.7		
Approximate Chi Square Value (.05)	85.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.76
Adjusted Chi Square Value	82.74	95% Jackknife UCL	10.85
		95% Standard Bootstrap UCL	10.75
Anderson-Darling Test Statistic	3.727	95% Bootstrap-t UCL	10.44
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	10.32
Kolmogorov-Smirnov Test Statistic	0.519	95% Percentile Bootstrap UCL	10.45
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	10.38
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.69
		97.5% Chebyshev(Mean, Sd) UCL	14.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.68
95% Approximate Gamma UCL	12.16		
95% Adjusted Gamma UCL	12.59		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.69
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.06	Minimum of Log Data	0.0583
Maximum	8.33	Maximum of Log Data	2.12
Mean	4.695	Mean of log Data	1.476
Median	4.695	SD of log Data	0.455
SD	1.484		
Coefficient of Variation	0.316		
Skewness	1.7E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.492
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.429	95% H-UCL	6.359
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.512
95% Adjusted-CLT UCL (Chen-1995)	5.372	97.5% Chebyshev (MVUE) UCL	8.681
95% Modified-t UCL (Johnson-1978)	5.429	99% Chebyshev (MVUE) UCL	10.98
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.642	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.832		
MLE of Mean	4.695		
MLE of Standard Deviation	1.977		
nu star	146.7		
Approximate Chi Square Value (.05)	119.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	5.372
Adjusted Chi Square Value	116.2	95% Jackknife UCL	5.429
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.216	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.472	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.489
		97.5% Chebyshev(Mean, Sd) UCL	7.265
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.79
95% Approximate Gamma UCL	5.754		
95% Adjusted Gamma UCL	5.926		
Potential UCL to Use		Use 95% Student's-t UCL	5.429
		or 95% Modified-t UCL	5.429

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0051	Minimum of Log Data	-5.279
Maximum	0.251	Maximum of Log Data	-1.383
Mean	0.128	Mean of log Data	-2.252
Median	0.128	SD of log Data	0.928
SD	0.0501		
Coefficient of Variation	0.392		
Skewness	4.1E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.422
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.153	95% H-UCL	0.336
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.341
95% Adjusted-CLT UCL (Chen-1995)	0.151	97.5% Chebyshev (MVUE) UCL	0.421
95% Modified-t UCL (Johnson-1978)	0.153	99% Chebyshev (MVUE) UCL	0.579
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.132	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.06		
MLE of Mean	0.128		
MLE of Standard Deviation	0.0876		
nu star	55.43		
Approximate Chi Square Value (.05)	39.32	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	0.151
Adjusted Chi Square Value	37.39	95% Jackknife UCL	0.153
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.471	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.504	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.239	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.189
		97.5% Chebyshev(Mean, Sd) UCL	0.215
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.266
95% Approximate Gamma UCL	0.18		
95% Adjusted Gamma UCL	0.19		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.189

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	93	Minimum of Log Data	4.533
Maximum	663.2	Maximum of Log Data	6.497
Mean	270.1	Mean of log Data	5.428
Median	187.2	SD of log Data	0.597
SD	172.7		
Coefficient of Variation	0.64		
Skewness	1.22		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	355.4	95% H-UCL	399.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	468.1
95% Adjusted-CLT UCL (Chen-1995)	366.2	97.5% Chebyshev (MVUE) UCL	554.8
95% Modified-t UCL (Johnson-1978)	358.1	99% Chebyshev (MVUE) UCL	724.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.43	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	111.1		
MLE of Mean	270.1		
MLE of Standard Deviation	173.2		
nu star	63.17		
Approximate Chi Square Value (.05)	45.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	348.9
Adjusted Chi Square Value	43.8	95% Jackknife UCL	355.4
		95% Standard Bootstrap UCL	344.2
Anderson-Darling Test Statistic	0.43	95% Bootstrap-t UCL	389.3
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	374.3
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	350.1
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	372.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	478.9
		97.5% Chebyshev(Mean, Sd) UCL	569.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	746.8
95% Approximate Gamma UCL	371.8		
95% Adjusted Gamma UCL	389.5		
Potential UCL to Use		Use 95% Approximate Gamma UCL	371.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	6.76	Minimum of Log Data	1.911
Maximum	113	Maximum of Log Data	4.727
Mean	59.88	Mean of log Data	3.973
Median	59.88	SD of log Data	0.644
SD	21.69		
Coefficient of Variation	0.362		
Skewness	5.6E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.458
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.6	95% H-UCL	100.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.2
95% Adjusted-CLT UCL (Chen-1995)	69.77	97.5% Chebyshev (MVUE) UCL	138.8
95% Modified-t UCL (Johnson-1978)	70.6	99% Chebyshev (MVUE) UCL	183

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.408	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.57		
MLE of Mean	59.88		
MLE of Standard Deviation	32.44		
nu star	88.6		
Approximate Chi Square Value (.05)	67.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	69.77
Adjusted Chi Square Value	65.32	95% Jackknife UCL	70.6
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.316	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.1
		97.5% Chebyshev(Mean, Sd) UCL	97.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	119.7
95% Approximate Gamma UCL	78.14		
95% Adjusted Gamma UCL	81.22		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	86.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.507	Minimum of Log Data	-0.679
Maximum	8	Maximum of Log Data	2.079
Mean	4.254	Mean of log Data	1.333
Median	4.254	SD of log Data	0.629
SD	1.53		
Coefficient of Variation	0.36		
Skewness	-1.6E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.46
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.01	95% H-UCL	6.984
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.13
95% Adjusted-CLT UCL (Chen-1995)	4.951	97.5% Chebyshev (MVUE) UCL	9.683
95% Modified-t UCL (Johnson-1978)	5.01	99% Chebyshev (MVUE) UCL	12.73
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.518	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.209		
MLE of Mean	4.254		
MLE of Standard Deviation	2.268		
nu star	91.47		
Approximate Chi Square Value (.05)	70.42	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	4.951
Adjusted Chi Square Value	67.79	95% Jackknife UCL	5.01
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.308	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.486	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.103
		97.5% Chebyshev(Mean, Sd) UCL	6.903
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.474
95% Approximate Gamma UCL	5.525		
95% Adjusted Gamma UCL	5.739		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.103

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.21	Minimum of Log Data	2.22
Maximum	169	Maximum of Log Data	5.13
Mean	89.11	Mean of log Data	4.364
Median	89.11	SD of log Data	0.668
SD	32.62		
Coefficient of Variation	0.366		
Skewness	-1.5E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.574	Shapiro Wilk Test Statistic	0.454
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	105.2	95% H-UCL	153.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	177.4
95% Adjusted-CLT UCL (Chen-1995)	104	97.5% Chebyshev (MVUE) UCL	212.5
95% Modified-t UCL (Johnson-1978)	105.2	99% Chebyshev (MVUE) UCL	281.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.242	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.48		
MLE of Mean	89.11		
MLE of Standard Deviation	49.48		
nu star	84.3		
Approximate Chi Square Value (.05)	64.14	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	104
Adjusted Chi Square Value	61.64	95% Jackknife UCL	105.2
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.329	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	128.5
		97.5% Chebyshev(Mean, Sd) UCL	145.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	179.1
95% Approximate Gamma UCL	117.1		
95% Adjusted Gamma UCL	121.9		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	128.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.37	Minimum of Log Data	-0.994
Maximum	2.3	Maximum of Log Data	0.833
Mean	1.39	Mean of log Data	0.267
Median	1.39	SD of log Data	0.423
SD	0.413		
Coefficient of Variation	0.297		
Skewness	-0.473		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.636	Shapiro Wilk Test Statistic	0.535
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.604	95% H-UCL	1.855
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.184
95% Adjusted-CLT UCL (Chen-1995)	1.569	97.5% Chebyshev (MVUE) UCL	2.516
95% Modified-t UCL (Johnson-1978)	1.602	99% Chebyshev (MVUE) UCL	3.168
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.228	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.223		
MLE of Mean	1.39		
MLE of Standard Deviation	0.557		
nu star	149.5		
Approximate Chi Square Value (.05)	122.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	1.586
Adjusted Chi Square Value	118.5	95% Jackknife UCL	1.604
		95% Standard Bootstrap UCL	1.58
Anderson-Darling Test Statistic	2.644	95% Bootstrap-t UCL	1.567
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	1.614
Kolmogorov-Smirnov Test Statistic	0.463	95% Percentile Bootstrap UCL	1.56
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	1.551
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.91
		97.5% Chebyshev(Mean, Sd) UCL	2.135
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.578
95% Approximate Gamma UCL	1.7		
95% Adjusted Gamma UCL	1.754		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.604
	or 95% Modified-t UCL	1.602

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	17.3	Maximum of Log Data	2.851
Mean	10.81	Mean of log Data	2.329
Median	10.91	SD of log Data	0.343
SD	3.554		
Coefficient of Variation	0.329		
Skewness	0.414		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.65	95% H-UCL	13.34
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.56
95% Adjusted-CLT UCL (Chen-1995)	12.63	97.5% Chebyshev (MVUE) UCL	17.6
95% Modified-t UCL (Johnson-1978)	12.67	99% Chebyshev (MVUE) UCL	21.62
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.414	Data appear Normal at 5% Significance Level	
Theta Star	1.458		
MLE of Mean	10.81		
MLE of Standard Deviation	3.971		
nu star	177.9		
Approximate Chi Square Value (.05)	148.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.5
Adjusted Chi Square Value	143.9	95% Jackknife UCL	12.65
		95% Standard Bootstrap UCL	12.43
Anderson-Darling Test Statistic	0.489	95% Bootstrap-t UCL	12.78
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	13.33
Kolmogorov-Smirnov Test Statistic	0.189	95% Percentile Bootstrap UCL	12.35
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	12.59
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.28
		97.5% Chebyshev(Mean, Sd) UCL	17.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	21.02
95% Approximate Gamma UCL	12.99		
95% Adjusted Gamma UCL	13.37		
Potential UCL to Use		Use 95% Student's-t UCL	12.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.52	Minimum of Log Data	-0.654
Maximum	1.1	Maximum of Log Data	0.0953
Mean	0.72	Mean of log Data	-0.344
Median	0.72	SD of log Data	0.182
SD	0.14		
Coefficient of Variation	0.195		
Skewness	1.618		

Warning: There are only 4 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk Test Statistic	0.701
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.793	95% H-UCL	0.797
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.885
95% Adjusted-CLT UCL (Chen-1995)	0.807	97.5% Chebyshev (MVUE) UCL	0.957
95% Modified-t UCL (Johnson-1978)	0.796	99% Chebyshev (MVUE) UCL	1.098

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	23.95	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0301		
MLE of Mean	0.72		
MLE of Standard Deviation	0.147		
nu star	574.9		
Approximate Chi Square Value (.05)	520.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.787
Adjusted Chi Square Value	512.3	95% Jackknife UCL	0.793
		95% Standard Bootstrap UCL	0.785
Anderson-Darling Test Statistic	2.031	95% Bootstrap-t UCL	0.815
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	1.166
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	0.785
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.798
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.897
		97.5% Chebyshev(Mean, Sd) UCL	0.973
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.123
95% Approximate Gamma UCL	0.796		
95% Adjusted Gamma UCL	0.808		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.793
	or 95% Modified-t UCL	0.796

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.067	Minimum of Log Data	-2.703
Maximum	3.9	Maximum of Log Data	1.361
Mean	1.439	Mean of log Data	0.0736
Median	1.439	SD of log Data	1.017
SD	0.911		
Coefficient of Variation	0.633		
Skewness	1.593		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.664	Shapiro Wilk Test Statistic	0.638
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.911	95% H-UCL	4.461
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.037
95% Adjusted-CLT UCL (Chen-1995)	2.001	97.5% Chebyshev (MVUE) UCL	5.047
95% Modified-t UCL (Johnson-1978)	1.931	99% Chebyshev (MVUE) UCL	7.031
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.459	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.986		
MLE of Mean	1.439		
MLE of Standard Deviation	1.191		
nu star	35.02		
Approximate Chi Square Value (.05)	22.48	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.871
Adjusted Chi Square Value	20.96	95% Jackknife UCL	1.911
		95% Standard Bootstrap UCL	1.866
Anderson-Darling Test Statistic	2.084	95% Bootstrap-t UCL	2.05
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	4.357
Kolmogorov-Smirnov Test Statistic	0.43	95% Percentile Bootstrap UCL	1.873
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	1.964
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.585
		97.5% Chebyshev(Mean, Sd) UCL	3.081
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.055
95% Approximate Gamma UCL	2.242		
95% Adjusted Gamma UCL	2.404		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.585

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	15.7	Minimum of Log Data	2.754
Maximum	85	Maximum of Log Data	4.443
Mean	52.28	Mean of log Data	3.868
Median	46.3	SD of log Data	0.464
SD	21.72		
Coefficient of Variation	0.415		
Skewness	0.516		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.847	Shapiro Wilk Test Statistic	0.85
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.54	95% H-UCL	71.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	84.21
95% Adjusted-CLT UCL (Chen-1995)	63.59	97.5% Chebyshev (MVUE) UCL	97.82
95% Modified-t UCL (Johnson-1978)	63.69	99% Chebyshev (MVUE) UCL	124.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.413	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	11.85		
MLE of Mean	52.28		
MLE of Standard Deviation	24.89		
nu star	105.9		
Approximate Chi Square Value (.05)	83.17	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	62.59
Adjusted Chi Square Value	80.1	95% Jackknife UCL	63.54
		95% Standard Bootstrap UCL	62.22
Anderson-Darling Test Statistic	0.779	95% Bootstrap-t UCL	64.79
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	63.99
Kolmogorov-Smirnov Test Statistic	0.212	95% Percentile Bootstrap UCL	62.43
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	63.22
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.61
		97.5% Chebyshev(Mean, Sd) UCL	91.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	114.7
95% Approximate Gamma UCL	66.58		
95% Adjusted Gamma UCL	69.13		
Potential UCL to Use		Use 95% Approximate Gamma UCL	66.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	8.5	Minimum of Log Data	2.14
Maximum	14	Maximum of Log Data	2.639
Mean	10.4	Mean of log Data	2.335
Median	10.4	SD of log Data	0.121
SD	1.33		
Coefficient of Variation	0.128		
Skewness	1.617		

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk Test Statistic	0.69
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.09	95% H-UCL	11.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.98
95% Adjusted-CLT UCL (Chen-1995)	11.22	97.5% Chebyshev (MVUE) UCL	12.66
95% Modified-t UCL (Johnson-1978)	11.12	99% Chebyshev (MVUE) UCL	14.01
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	54.42	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.191		
MLE of Mean	10.4		
MLE of Standard Deviation	1.41		
nu star	1306		
Approximate Chi Square Value (.05)	1223	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.03
Adjusted Chi Square Value	1211	95% Jackknife UCL	11.09
		95% Standard Bootstrap UCL	11.01
Anderson-Darling Test Statistic	2.05	95% Bootstrap-t UCL	11.3
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	14.63
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	11
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.07
		97.5% Chebyshev(Mean, Sd) UCL	12.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.22
95% Approximate Gamma UCL	11.11		
95% Adjusted Gamma UCL	11.22		
Potential UCL to Use		Use 95% Student's-t UCL	11.09
		or 95% Modified-t UCL	11.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	28.24	Minimum of Log Data	3.341
Maximum	218.2	Maximum of Log Data	5.385
Mean	93.8	Mean of log Data	4.356
Median	88.03	SD of log Data	0.644
SD	60.2		
Coefficient of Variation	0.642		
Skewness	1.154		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	125	95% H-UCL	150.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	173.1
95% Adjusted-CLT UCL (Chen-1995)	128.6	97.5% Chebyshev (MVUE) UCL	207.2
95% Modified-t UCL (Johnson-1978)	126	99% Chebyshev (MVUE) UCL	274.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.2	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	42.63		
MLE of Mean	93.8		
MLE of Standard Deviation	63.23		
nu star	52.81		
Approximate Chi Square Value (.05)	37.11	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	122.4
Adjusted Chi Square Value	35.11	95% Jackknife UCL	125
		95% Standard Bootstrap UCL	120.7
Anderson-Darling Test Statistic	0.373	95% Bootstrap-t UCL	142.6
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	208.6
Kolmogorov-Smirnov Test Statistic	0.174	95% Percentile Bootstrap UCL	123.3
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	128.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	169.5
		97.5% Chebyshev(Mean, Sd) UCL	202.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	266.7
95% Approximate Gamma UCL	133.5		
95% Adjusted Gamma UCL	141.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	133.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	8806	Minimum of Log Data	9.083
Maximum	66573	Maximum of Log Data	11.11
Mean	30602	Mean of log Data	10.18
Median	27486	SD of log Data	0.581
SD	16869		
Coefficient of Variation	0.551		
Skewness	0.932		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	39348	95% H-UCL	46453
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54104
95% Adjusted-CLT UCL (Chen-1995)	40011	97.5% Chebyshev (MVUE) UCL	64167
95% Modified-t UCL (Johnson-1978)	39566	99% Chebyshev (MVUE) UCL	83936
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.757	Data appear Normal at 5% Significance Level	
Theta Star	11098		
MLE of Mean	30602		
MLE of Standard Deviation	18429		
nu star	66.18		
Approximate Chi Square Value (.05)	48.46	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	38612
Adjusted Chi Square Value	46.15	95% Jackknife UCL	39348
		95% Standard Bootstrap UCL	38361
Anderson-Darling Test Statistic	0.16	95% Bootstrap-t UCL	42713
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	46103
Kolmogorov-Smirnov Test Statistic	0.119	95% Percentile Bootstrap UCL	38896
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	40122
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	51829
		97.5% Chebyshev(Mean, Sd) UCL	61014
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	79056
95% Approximate Gamma UCL	41792		
95% Adjusted Gamma UCL	43881		
Potential UCL to Use		Use 95% Student's-t UCL	39348

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	300.9	Minimum of Log Data	5.707
Maximum	1758	Maximum of Log Data	7.472
Mean	770.3	Mean of log Data	6.497
Median	587.4	SD of log Data	0.561
SD	467.1		
Coefficient of Variation	0.606		
Skewness	1.249		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.855	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1012	95% H-UCL	1130
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1320
95% Adjusted-CLT UCL (Chen-1995)	1044	97.5% Chebyshev (MVUE) UCL	1561
95% Modified-t UCL (Johnson-1978)	1021	99% Chebyshev (MVUE) UCL	2033
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.67	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	288.6		
MLE of Mean	770.3		
MLE of Standard Deviation	471.5		
nu star	64.07		
Approximate Chi Square Value (.05)	46.65	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	992.1
Adjusted Chi Square Value	44.39	95% Jackknife UCL	1012
		95% Standard Bootstrap UCL	980.6
Anderson-Darling Test Statistic	0.349	95% Bootstrap-t UCL	1163
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	1250
Kolmogorov-Smirnov Test Statistic	0.188	95% Percentile Bootstrap UCL	998.7
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	1031
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1358
		97.5% Chebyshev(Mean, Sd) UCL	1612
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2112
95% Approximate Gamma UCL	1058		
95% Adjusted Gamma UCL	1112		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1058

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0114	Minimum of Log Data	-4.474
Maximum	10.94	Maximum of Log Data	2.392
Mean	8.017	Mean of log Data	1.363
Median	10	SD of log Data	2.168
SD	3.844		
Coefficient of Variation	0.479		
Skewness	-1.76		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.647	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.01	95% H-UCL	1332
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	101.3
95% Adjusted-CLT UCL (Chen-1995)	9.24	97.5% Chebyshev (MVUE) UCL	134
95% Modified-t UCL (Johnson-1978)	9.916	99% Chebyshev (MVUE) UCL	198.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.672	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.92		
MLE of Mean	8.017		
MLE of Standard Deviation	9.777		
nu star	16.14		
Approximate Chi Square Value (.05)	8.06	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.842
Adjusted Chi Square Value	7.205	95% Jackknife UCL	10.01
		95% Standard Bootstrap UCL	9.791
Anderson-Darling Test Statistic	2.957	95% Bootstrap-t UCL	9.52
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	9.339
Kolmogorov-Smirnov Test Statistic	0.437	95% Percentile Bootstrap UCL	9.668
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	9.345
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.85
		97.5% Chebyshev(Mean, Sd) UCL	14.95
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.06
95% Approximate Gamma UCL	16.05		
95% Adjusted Gamma UCL	17.96		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.06
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0034	Minimum of Log Data	-5.684
Maximum	1.74	Maximum of Log Data	0.554
Mean	0.872	Mean of log Data	-0.542
Median	0.872	SD of log Data	1.631
SD	0.37		
Coefficient of Variation	0.425		
Skewness	-5E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.398
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.064	95% H-UCL	17.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.822
95% Adjusted-CLT UCL (Chen-1995)	1.048	97.5% Chebyshev (MVUE) UCL	7.566
95% Modified-t UCL (Johnson-1978)	1.064	99% Chebyshev (MVUE) UCL	10.99

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.09	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.8		
MLE of Mean	0.872		
MLE of Standard Deviation	0.835		
nu star	26.15		
Approximate Chi Square Value (.05)	15.49	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.048
Adjusted Chi Square Value	14.25	95% Jackknife UCL	1.064
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.424	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.53	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.338
		97.5% Chebyshev(Mean, Sd) UCL	1.539
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.935
95% Approximate Gamma UCL	1.471		
95% Adjusted Gamma UCL	1.599		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	1.935
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	123.4	Minimum of Log Data	4.816
Maximum	697.1	Maximum of Log Data	6.547
Mean	366.8	Mean of log Data	5.778
Median	345.9	SD of log Data	0.546
SD	184.9		
Coefficient of Variation	0.504		
Skewness	0.639		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	462.7	95% H-UCL	538.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	630.9
95% Adjusted-CLT UCL (Chen-1995)	465.1	97.5% Chebyshev (MVUE) UCL	743.9
95% Modified-t UCL (Johnson-1978)	464.3	99% Chebyshev (MVUE) UCL	965.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.136	Data appear Normal at 5% Significance Level	
Theta Star	117		
MLE of Mean	366.8		
MLE of Standard Deviation	207.1		
nu star	75.27		
Approximate Chi Square Value (.05)	56.29	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	454.6
Adjusted Chi Square Value	53.79	95% Jackknife UCL	462.7
		95% Standard Bootstrap UCL	449.6
Anderson-Darling Test Statistic	0.268	95% Bootstrap-t UCL	479.8
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	483.3
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	452.3
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	456.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	599.5
		97.5% Chebyshev(Mean, Sd) UCL	700.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	898
95% Approximate Gamma UCL	490.5		
95% Adjusted Gamma UCL	513.3		
Potential UCL to Use		Use 95% Student's-t UCL	462.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.37	Minimum of Log Data	-0.994
Maximum	10	Maximum of Log Data	2.303
Mean	4.67	Mean of log Data	1.31
Median	5	SD of log Data	0.893
SD	2.359		
Coefficient of Variation	0.505		
Skewness	0.189		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.729	Shapiro Wilk Test Statistic	0.632
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.893	95% H-UCL	11.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.6
95% Adjusted-CLT UCL (Chen-1995)	5.83	97.5% Chebyshev (MVUE) UCL	14.33
95% Modified-t UCL (Johnson-1978)	5.899	99% Chebyshev (MVUE) UCL	19.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.795	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.601		
MLE of Mean	4.67		
MLE of Standard Deviation	3.485		
nu star	43.09		
Approximate Chi Square Value (.05)	29.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.79
Adjusted Chi Square Value	27.29	95% Jackknife UCL	5.893
		95% Standard Bootstrap UCL	5.762
Anderson-Darling Test Statistic	2.179	95% Bootstrap-t UCL	5.883
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	6.177
Kolmogorov-Smirnov Test Statistic	0.421	95% Percentile Bootstrap UCL	5.806
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	5.833
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.639
		97.5% Chebyshev(Mean, Sd) UCL	8.924
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.45
95% Approximate Gamma UCL	6.93		
95% Adjusted Gamma UCL	7.374		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	7.639

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.043	Minimum of Log Data	-3.147
Maximum	12.87	Maximum of Log Data	2.555
Mean	9.32	Mean of log Data	1.86
Median	10	SD of log Data	1.579
SD	3.051		
Coefficient of Variation	0.327		
Skewness	-2.886		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.525	Shapiro Wilk Test Statistic	0.363
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.9	95% H-UCL	154.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.82
95% Adjusted-CLT UCL (Chen-1995)	9.985	97.5% Chebyshev (MVUE) UCL	76.27
95% Modified-t UCL (Johnson-1978)	10.78	99% Chebyshev (MVUE) UCL	110.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.173	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.948		
MLE of Mean	9.32		
MLE of Standard Deviation	8.607		
nu star	28.14		
Approximate Chi Square Value (.05)	17.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.77
Adjusted Chi Square Value	15.73	95% Jackknife UCL	10.9
		95% Standard Bootstrap UCL	10.68
Anderson-Darling Test Statistic	3.793	95% Bootstrap-t UCL	10.38
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	10.2
Kolmogorov-Smirnov Test Statistic	0.525	95% Percentile Bootstrap UCL	10.42
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	10.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.16
		97.5% Chebyshev(Mean, Sd) UCL	14.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.08
95% Approximate Gamma UCL	15.39		
95% Adjusted Gamma UCL	16.67		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.08
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.57	Minimum of Log Data	0.451
Maximum	101	Maximum of Log Data	4.615
Mean	51.29	Mean of log Data	3.703
Median	51.29	SD of log Data	1.043
SD	21.2		
Coefficient of Variation	0.413		
Skewness	1.8E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.435
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	62.27	95% H-UCL	179
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	158
95% Adjusted-CLT UCL (Chen-1995)	61.35	97.5% Chebyshev (MVUE) UCL	197.9
95% Modified-t UCL (Johnson-1978)	62.27	99% Chebyshev (MVUE) UCL	276.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.772	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.94		
MLE of Mean	51.29		
MLE of Standard Deviation	38.52		
nu star	42.54		
Approximate Chi Square Value (.05)	28.58	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	61.35
Adjusted Chi Square Value	26.85	95% Jackknife UCL	62.27
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.148	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.96
		97.5% Chebyshev(Mean, Sd) UCL	89.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	112.2
95% Approximate Gamma UCL	76.32		
95% Adjusted Gamma UCL	81.25		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	77.96

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	0.42	Maximum of Log Data	-0.868
Mean	0.313	Mean of log Data	-1.201
Median	0.313	SD of log Data	0.335
SD	0.0751		
Coefficient of Variation	0.24		
Skewness	-1.619		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk Test Statistic	0.549
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.352	95% H-UCL	0.388
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.452
95% Adjusted-CLT UCL (Chen-1995)	0.338	97.5% Chebyshev (MVUE) UCL	0.51
95% Modified-t UCL (Johnson-1978)	0.351	99% Chebyshev (MVUE) UCL	0.625

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.459	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0331		
MLE of Mean	0.313		
MLE of Standard Deviation	0.102		
nu star	227		
Approximate Chi Square Value (.05)	193.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.349
Adjusted Chi Square Value	188.4	95% Jackknife UCL	0.352
		95% Standard Bootstrap UCL	0.349
Anderson-Darling Test Statistic	2.384	95% Bootstrap-t UCL	0.345
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.343
Kolmogorov-Smirnov Test Statistic	0.454	95% Percentile Bootstrap UCL	0.346
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.338
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.408
		97.5% Chebyshev(Mean, Sd) UCL	0.449
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.529
95% Approximate Gamma UCL	0.368		
95% Adjusted Gamma UCL	0.378		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.352
		or 95% Modified-t UCL	0.351

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.92	Minimum of Log Data	-0.0834
Maximum	13.9	Maximum of Log Data	2.632
Mean	7.41	Mean of log Data	1.881
Median	7.41	SD of log Data	0.645
SD	2.767		
Coefficient of Variation	0.373		
Skewness	1.2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.483
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	8.845	95% H-UCL	12.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.58
95% Adjusted-CLT UCL (Chen-1995)	8.724	97.5% Chebyshev (MVUE) UCL	17.46
95% Modified-t UCL (Johnson-1978)	8.845	99% Chebyshev (MVUE) UCL	23.12
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.263	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.271		
MLE of Mean	7.41		
MLE of Standard Deviation	4.102		
nu star	78.32		
Approximate Chi Square Value (.05)	58.93	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	8.724
Adjusted Chi Square Value	56.37	95% Jackknife UCL	8.845
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.943	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.89
		97.5% Chebyshev(Mean, Sd) UCL	12.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.36
95% Approximate Gamma UCL	9.848		
95% Adjusted Gamma UCL	10.3		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	10.89

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0082	Minimum of Log Data	-4.804
Maximum	0.121	Maximum of Log Data	-2.112
Mean	0.0646	Mean of log Data	-2.86
Median	0.0646	SD of log Data	0.638
SD	0.024		
Coefficient of Variation	0.372		
Skewness	-1E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.077	95% H-UCL	0.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.126
95% Adjusted-CLT UCL (Chen-1995)	0.076	97.5% Chebyshev (MVUE) UCL	0.151
95% Modified-t UCL (Johnson-1978)	0.077	99% Chebyshev (MVUE) UCL	0.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.309	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0195		
MLE of Mean	0.0646		
MLE of Standard Deviation	0.0355		
nu star	79.4		
Approximate Chi Square Value (.05)	59.87	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.076
Adjusted Chi Square Value	57.29	95% Jackknife UCL	0.077
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.94	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.481	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0948
		97.5% Chebyshev(Mean, Sd) UCL	0.108
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.134
95% Approximate Gamma UCL	0.0856		
95% Adjusted Gamma UCL	0.0895		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.0948

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	24.32	Minimum of Log Data	3.191
Maximum	445	Maximum of Log Data	6.098
Mean	193.5	Mean of log Data	5.004
Median	159.9	SD of log Data	0.825
SD	132.8		
Coefficient of Variation	0.686		
Skewness	0.762		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.927	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	262.3	95% H-UCL	400.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	423
95% Adjusted-CLT UCL (Chen-1995)	265.5	97.5% Chebyshev (MVUE) UCL	518.6
95% Modified-t UCL (Johnson-1978)	263.7	99% Chebyshev (MVUE) UCL	706.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.604	Data appear Normal at 5% Significance Level	
Theta Star	120.6		
MLE of Mean	193.5		
MLE of Standard Deviation	152.8		
nu star	38.5		
Approximate Chi Square Value (.05)	25.29	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	256.5
Adjusted Chi Square Value	23.67	95% Jackknife UCL	262.3
		95% Standard Bootstrap UCL	252.3
Anderson-Darling Test Statistic	0.14	95% Bootstrap-t UCL	281.3
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	270.9
Kolmogorov-Smirnov Test Statistic	0.085	95% Percentile Bootstrap UCL	257.1
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	263.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	360.6
		97.5% Chebyshev(Mean, Sd) UCL	432.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	574.8
95% Approximate Gamma UCL	294.6		
95% Adjusted Gamma UCL	314.8		
Potential UCL to Use		Use 95% Student's-t UCL	262.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.76	Minimum of Log Data	-0.274
Maximum	52.2	Maximum of Log Data	3.955
Mean	26.48	Mean of log Data	3.037
Median	26.48	SD of log Data	1.061
SD	10.97		
Coefficient of Variation	0.414		
Skewness	6E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.433
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	32.17	95% H-UCL	96.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	83.41
95% Adjusted-CLT UCL (Chen-1995)	31.69	97.5% Chebyshev (MVUE) UCL	104.7
95% Modified-t UCL (Johnson-1978)	32.17	99% Chebyshev (MVUE) UCL	146.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.737	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.25		
MLE of Mean	26.48		
MLE of Standard Deviation	20.09		
nu star	41.68		
Approximate Chi Square Value (.05)	27.88	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	31.69
Adjusted Chi Square Value	26.17	95% Jackknife UCL	32.17
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.157	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.505	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.28
		97.5% Chebyshev(Mean, Sd) UCL	46.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	57.98
95% Approximate Gamma UCL	39.58		
95% Adjusted Gamma UCL	42.17		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	40.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.06	Minimum of Log Data	-2.813
Maximum	3.33	Maximum of Log Data	1.203
Mean	1.695	Mean of log Data	0.306
Median	1.695	SD of log Data	1.001
SD	0.697		
Coefficient of Variation	0.411		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.439
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.056	95% H-UCL	5.405
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.969
95% Adjusted-CLT UCL (Chen-1995)	2.026	97.5% Chebyshev (MVUE) UCL	6.203
95% Modified-t UCL (Johnson-1978)	2.056	99% Chebyshev (MVUE) UCL	8.627

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.859	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.912		
MLE of Mean	1.695		
MLE of Standard Deviation	1.243		
nu star	44.61		
Approximate Chi Square Value (.05)	30.29	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	2.026
Adjusted Chi Square Value	28.5	95% Jackknife UCL	2.056
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.127	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.502	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.572
		97.5% Chebyshev(Mean, Sd) UCL	2.952
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.697
95% Approximate Gamma UCL	2.496		
95% Adjusted Gamma UCL	2.653		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.572

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.98	Minimum of Log Data	-0.0202
Maximum	94.2	Maximum of Log Data	4.545
Mean	47.59	Mean of log Data	3.596
Median	47.59	SD of log Data	1.156
SD	19.87		
Coefficient of Variation	0.418		
Skewness	-2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.425
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	57.89	95% H-UCL	217.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	168.4
95% Adjusted-CLT UCL (Chen-1995)	57.03	97.5% Chebyshev (MVUE) UCL	213
95% Modified-t UCL (Johnson-1978)	57.89	99% Chebyshev (MVUE) UCL	300.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.575	Data do not follow a Discernable Distribution (0.05)	
Theta Star	30.22		
MLE of Mean	47.59		
MLE of Standard Deviation	37.92		
nu star	37.8		
Approximate Chi Square Value (.05)	24.72	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	57.03
Adjusted Chi Square Value	23.12	95% Jackknife UCL	57.89
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.204	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.51	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.6
		97.5% Chebyshev(Mean, Sd) UCL	83.42
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.7
95% Approximate Gamma UCL	72.77		
95% Adjusted Gamma UCL	77.81		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	72.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	28.4	Minimum of Log Data	3.346
Maximum	46.5	Maximum of Log Data	3.839
Mean	34.5	Mean of log Data	3.534
Median	34.5	SD of log Data	0.121
SD	4.431		
Coefficient of Variation	0.128		
Skewness	1.624		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.684
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	36.8	95% H-UCL	36.84
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.76
95% Adjusted-CLT UCL (Chen-1995)	37.25	97.5% Chebyshev (MVUE) UCL	42.04
95% Modified-t UCL (Johnson-1978)	36.9	99% Chebyshev (MVUE) UCL	46.52

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	53.99	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.639		
MLE of Mean	34.5		
MLE of Standard Deviation	4.695		
nu star	1296		
Approximate Chi Square Value (.05)	1213	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	36.6
Adjusted Chi Square Value	1201	95% Jackknife UCL	36.8
		95% Standard Bootstrap UCL	36.53
Anderson-Darling Test Statistic	2.068	95% Bootstrap-t UCL	37.5
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	48.55
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	36.52
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	36.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.08
		97.5% Chebyshev(Mean, Sd) UCL	42.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	47.23
95% Approximate Gamma UCL	36.85		
95% Adjusted Gamma UCL	37.22		

Potential UCL to Use		
	Use 95% Student's-t UCL	36.8
	or 95% Modified-t UCL	36.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-06.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Americium-241

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.23	Minimum of Log Data	-1.47
Maximum	2.7	Maximum of Log Data	0.993
Mean	1.465	Mean of log Data	0.279
Median	1.465	SD of log Data	0.578
SD	0.527		
Coefficient of Variation	0.359		
Skewness	1.7E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.495
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.738	95% H-UCL	2.307
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.689
95% Adjusted-CLT UCL (Chen-1995)	1.715	97.5% Chebyshev (MVUE) UCL	3.187
95% Modified-t UCL (Johnson-1978)	1.738	99% Chebyshev (MVUE) UCL	4.166
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.805	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.385		
MLE of Mean	1.465		
MLE of Standard Deviation	0.751		
nu star	91.31		
Approximate Chi Square Value (.05)	70.28	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.715
Adjusted Chi Square Value	67.47	95% Jackknife UCL	1.738
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.909	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.476	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.128
		97.5% Chebyshev(Mean, Sd) UCL	2.414
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.978
95% Approximate Gamma UCL	1.903		
95% Adjusted Gamma UCL	1.983		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.128

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	6.82	Minimum of Log Data	1.92
Maximum	11.31	Maximum of Log Data	2.426
Mean	9.571	Mean of log Data	2.241
Median	10.87	SD of log Data	0.198
SD	1.8		
Coefficient of Variation	0.188		
Skewness	-0.458		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.5	95% H-UCL	10.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.97
95% Adjusted-CLT UCL (Chen-1995)	10.35	97.5% Chebyshev (MVUE) UCL	13.01
95% Modified-t UCL (Johnson-1978)	10.49	99% Chebyshev (MVUE) UCL	15.04
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	21.75	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.44		
MLE of Mean	9.571		
MLE of Standard Deviation	2.052		
nu star	521.9		
Approximate Chi Square Value (.05)	470	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.43
Adjusted Chi Square Value	462.4	95% Jackknife UCL	10.5
		95% Standard Bootstrap UCL	10.4
Anderson-Darling Test Statistic	1.509	95% Bootstrap-t UCL	10.46
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.28
Kolmogorov-Smirnov Test Statistic	0.339	95% Percentile Bootstrap UCL	10.4
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.37
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.84
		97.5% Chebyshev(Mean, Sd) UCL	12.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.74
95% Approximate Gamma UCL	10.63		
95% Adjusted Gamma UCL	10.8		
Potential UCL to Use		Use 95% Student's-t UCL	10.5
		or 95% Modified-t UCL	10.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.05	Minimum of Log Data	-2.996
Maximum	0.84	Maximum of Log Data	-0.174
Mean	0.445	Mean of log Data	-0.939
Median	0.445	SD of log Data	0.673
SD	0.168		
Coefficient of Variation	0.378		
Skewness	-6E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.479
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.532	95% H-UCL	0.794
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.902
95% Adjusted-CLT UCL (Chen-1995)	0.525	97.5% Chebyshev (MVUE) UCL	1.085
95% Modified-t UCL (Johnson-1978)	0.532	99% Chebyshev (MVUE) UCL	1.444
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.077	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.145		
MLE of Mean	0.445		
MLE of Standard Deviation	0.254		
nu star	73.84		
Approximate Chi Square Value (.05)	55.05	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.525
Adjusted Chi Square Value	52.58	95% Jackknife UCL	0.532
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.958	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.483	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.657
		97.5% Chebyshev(Mean, Sd) UCL	0.749
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.929
95% Approximate Gamma UCL	0.597		
95% Adjusted Gamma UCL	0.625		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.657

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	13.1	Minimum of Log Data	2.573
Maximum	897.6	Maximum of Log Data	6.8
Mean	136.4	Mean of log Data	4.325
Median	85	SD of log Data	0.951
SD	240.8		
Coefficient of Variation	1.766		
Skewness	3.405		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.413	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	261.2	95% H-UCL	267.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	257.2
95% Adjusted-CLT UCL (Chen-1995)	323.8	97.5% Chebyshev (MVUE) UCL	319.6
95% Modified-t UCL (Johnson-1978)	272.6	99% Chebyshev (MVUE) UCL	442.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.791	Data do not follow a Discernable Distribution (0.05)	
Theta Star	172.5		
MLE of Mean	136.4		
MLE of Standard Deviation	153.4		
nu star	18.98		
Approximate Chi Square Value (.05)	10.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	250.7
Adjusted Chi Square Value	9.126	95% Jackknife UCL	261.2
		95% Standard Bootstrap UCL	248.9
Anderson-Darling Test Statistic	2.037	95% Bootstrap-t UCL	1077
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	1104
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	275
Kolmogorov-Smirnov 5% Critical Value	0.253	95% BCA Bootstrap UCL	344.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	439.4
		97.5% Chebyshev(Mean, Sd) UCL	570.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	828.2
95% Approximate Gamma UCL	256.2		
95% Adjusted Gamma UCL	283.6		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	439.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt-60

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	21.45	Minimum of Log Data	3.066
Maximum	207.4	Maximum of Log Data	5.334
Mean	92.47	Mean of log Data	4.341
Median	78.97	SD of log Data	0.659
SD	57.52		
Coefficient of Variation	0.622		
Skewness	0.932		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	122.3	95% H-UCL	152.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	173.9
95% Adjusted-CLT UCL (Chen-1995)	124.6	97.5% Chebyshev (MVUE) UCL	208.7
95% Modified-t UCL (Johnson-1978)	123	99% Chebyshev (MVUE) UCL	277
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.194	Data appear Normal at 5% Significance Level	
Theta Star	42.15		
MLE of Mean	92.47		
MLE of Standard Deviation	62.43		
nu star	52.64		
Approximate Chi Square Value (.05)	36.98	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	119.8
Adjusted Chi Square Value	34.98	95% Jackknife UCL	122.3
		95% Standard Bootstrap UCL	118.7
Anderson-Darling Test Statistic	0.218	95% Bootstrap-t UCL	131.9
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	132
Kolmogorov-Smirnov Test Statistic	0.13	95% Percentile Bootstrap UCL	118.2
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	125.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	164.8
		97.5% Chebyshev(Mean, Sd) UCL	196.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	257.7
95% Approximate Gamma UCL	131.6		
95% Adjusted Gamma UCL	139.2		
Potential UCL to Use		Use 95% Student's-t UCL	122.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	279.7	Minimum of Log Data	5.634
Maximum	933.3	Maximum of Log Data	6.839
Mean	548.3	Mean of log Data	6.243
Median	516.6	SD of log Data	0.376
SD	204.9		
Coefficient of Variation	0.374		
Skewness	0.653		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	654.5	95% H-UCL	692.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	811.5
95% Adjusted-CLT UCL (Chen-1995)	657.5	97.5% Chebyshev (MVUE) UCL	925.3
95% Modified-t UCL (Johnson-1978)	656.4	99% Chebyshev (MVUE) UCL	1149
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.049	Data appear Normal at 5% Significance Level	
Theta Star	90.65		
MLE of Mean	548.3		
MLE of Standard Deviation	222.9		
nu star	145.2		
Approximate Chi Square Value (.05)	118.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	645.6
Adjusted Chi Square Value	114.6	95% Jackknife UCL	654.5
		95% Standard Bootstrap UCL	641.7
Anderson-Darling Test Statistic	0.218	95% Bootstrap-t UCL	685.1
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	687.5
Kolmogorov-Smirnov Test Statistic	0.126	95% Percentile Bootstrap UCL	649.3
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	653.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	806.1
		97.5% Chebyshev(Mean, Sd) UCL	917.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1137
95% Approximate Gamma UCL	672.7		
95% Adjusted Gamma UCL	694.4		
Potential UCL to Use		Use 95% Student's-t UCL	654.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.0496	Minimum of Log Data	-3.004
Maximum	10	Maximum of Log Data	2.303
Mean	8.366	Mean of log Data	1.58
Median	10	SD of log Data	1.737
SD	3.816		
Coefficient of Variation	0.456		
Skewness	-2.057		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.468	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.34	95% H-UCL	219.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	58.29
95% Adjusted-CLT UCL (Chen-1995)	9.48	97.5% Chebyshev (MVUE) UCL	76.07
95% Modified-t UCL (Johnson-1978)	10.24	99% Chebyshev (MVUE) UCL	111
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.847	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.882		
MLE of Mean	8.366		
MLE of Standard Deviation	9.093		
nu star	20.32		
Approximate Chi Square Value (.05)	11.09	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.18
Adjusted Chi Square Value	10.06	95% Jackknife UCL	10.34
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.508	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.529	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.17
		97.5% Chebyshev(Mean, Sd) UCL	15.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.33
95% Approximate Gamma UCL	15.33		
95% Adjusted Gamma UCL	16.9		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.33
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Naphthalene

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.01	Minimum of Log Data	-4.605
Maximum	2.65	Maximum of Log Data	0.975
Mean	1.33	Mean of log Data	-0.0649
Median	1.33	SD of log Data	1.443
SD	0.563		
Coefficient of Variation	0.423		
Skewness	5.4E-16		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.407
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.622	95% H-UCL	13.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.849
95% Adjusted-CLT UCL (Chen-1995)	1.597	97.5% Chebyshev (MVUE) UCL	8.821
95% Modified-t UCL (Johnson-1978)	1.622	99% Chebyshev (MVUE) UCL	12.69
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.236	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.076		
MLE of Mean	1.33		
MLE of Standard Deviation	1.196		
nu star	29.67		
Approximate Chi Square Value (.05)	18.23	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.597
Adjusted Chi Square Value	16.88	95% Jackknife UCL	1.622
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.34	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.038
		97.5% Chebyshev(Mean, Sd) UCL	2.345
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.947
95% Approximate Gamma UCL	2.164		
95% Adjusted Gamma UCL	2.338		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.038

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	175.8	Minimum of Log Data	5.17
Maximum	1623	Maximum of Log Data	7.392
Mean	730.6	Mean of log Data	6.393
Median	653.8	SD of log Data	0.696
SD	448.9		
Coefficient of Variation	0.614		
Skewness	0.582		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	963.3	95% H-UCL	1261
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1421
95% Adjusted-CLT UCL (Chen-1995)	967	97.5% Chebyshev (MVUE) UCL	1714
95% Modified-t UCL (Johnson-1978)	967	99% Chebyshev (MVUE) UCL	2290
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.04	Data appear Normal at 5% Significance Level	
Theta Star	358.1		
MLE of Mean	730.6		
MLE of Standard Deviation	511.5		
nu star	48.97		
Approximate Chi Square Value (.05)	33.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	943.8
Adjusted Chi Square Value	32	95% Jackknife UCL	963.3
		95% Standard Bootstrap UCL	934.8
Anderson-Darling Test Statistic	0.273	95% Bootstrap-t UCL	999.6
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	973.2
Kolmogorov-Smirnov Test Statistic	0.141	95% Percentile Bootstrap UCL	936.9
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	955.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1295
		97.5% Chebyshev(Mean, Sd) UCL	1540
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2020
95% Approximate Gamma UCL	1055		
95% Adjusted Gamma UCL	1118		
Potential UCL to Use		Use 95% Student's-t UCL	963.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.33	Minimum of Log Data	-1.109
Maximum	5	Maximum of Log Data	1.609
Mean	4.25	Mean of log Data	1.215
Median	5	SD of log Data	0.932
SD	1.753		
Coefficient of Variation	0.412		
Skewness	-2.063		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.472	Shapiro Wilk Test Statistic	0.486
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.159	95% H-UCL	11.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.16
95% Adjusted-CLT UCL (Chen-1995)	4.76	97.5% Chebyshev (MVUE) UCL	13.84
95% Modified-t UCL (Johnson-1978)	5.109	99% Chebyshev (MVUE) UCL	19.11
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.79	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.374		
MLE of Mean	4.25		
MLE of Standard Deviation	3.176		
nu star	42.97		
Approximate Chi Square Value (.05)	28.94	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.082
Adjusted Chi Square Value	27.19	95% Jackknife UCL	5.159
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.391	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.515	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.456
		97.5% Chebyshev(Mean, Sd) UCL	7.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.285
95% Approximate Gamma UCL	6.31		
95% Adjusted Gamma UCL	6.716		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.456
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Selenium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.066	Minimum of Log Data	-2.718
Maximum	16.63	Maximum of Log Data	2.811
Mean	9.962	Mean of log Data	1.947
Median	10	SD of log Data	1.478
SD	3.728		
Coefficient of Variation	0.374		
Skewness	-1.345		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.686	Shapiro Wilk Test Statistic	0.408
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.9	95% H-UCL	116.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54.19
95% Adjusted-CLT UCL (Chen-1995)	11.29	97.5% Chebyshev (MVUE) UCL	69.92
95% Modified-t UCL (Johnson-1978)	11.83	99% Chebyshev (MVUE) UCL	100.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.23	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.098		
MLE of Mean	9.962		
MLE of Standard Deviation	8.982		
nu star	29.53		
Approximate Chi Square Value (.05)	18.12	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.73
Adjusted Chi Square Value	16.77	95% Jackknife UCL	11.9
		95% Standard Bootstrap UCL	11.71
Anderson-Darling Test Statistic	3.167	95% Bootstrap-t UCL	11.52
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	11.66
Kolmogorov-Smirnov Test Statistic	0.508	95% Percentile Bootstrap UCL	11.6
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	11.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.65
		97.5% Chebyshev(Mean, Sd) UCL	16.68
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.67
95% Approximate Gamma UCL	16.23		
95% Adjusted Gamma UCL	17.54		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	14.65

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Trichloroethene

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	146.4	Minimum of Log Data	4.986
Maximum	864.7	Maximum of Log Data	6.762
Mean	411.4	Mean of log Data	5.85
Median	320	SD of log Data	0.602
SD	256.4		
Coefficient of Variation	0.623		
Skewness	0.931		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.85	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	544.4	95% H-UCL	629.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	729.7
95% Adjusted-CLT UCL (Chen-1995)	554.4	97.5% Chebyshev (MVUE) UCL	868.3
95% Modified-t UCL (Johnson-1978)	547.7	99% Chebyshev (MVUE) UCL	1141
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.384	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	172.6		
MLE of Mean	411.4		
MLE of Standard Deviation	266.4		
nu star	57.22		
Approximate Chi Square Value (.05)	40.84	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	533.2
Adjusted Chi Square Value	38.73	95% Jackknife UCL	544.4
		95% Standard Bootstrap UCL	526.5
Anderson-Darling Test Statistic	0.47	95% Bootstrap-t UCL	591.6
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	546.1
Kolmogorov-Smirnov Test Statistic	0.151	95% Percentile Bootstrap UCL	532.9
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	542.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	734.1
		97.5% Chebyshev(Mean, Sd) UCL	873.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1148
95% Approximate Gamma UCL	576.5		
95% Adjusted Gamma UCL	607.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	576.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	13.1	Minimum of Log Data	2.573
Maximum	34.1	Maximum of Log Data	3.529
Mean	23.6	Mean of log Data	3.143
Median	23.6	SD of log Data	0.208
SD	4.477		
Coefficient of Variation	0.19		
Skewness	2.2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	25.92	95% H-UCL	26.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	29.86
95% Adjusted-CLT UCL (Chen-1995)	25.73	97.5% Chebyshev (MVUE) UCL	32.56
95% Modified-t UCL (Johnson-1978)	25.92	99% Chebyshev (MVUE) UCL	37.85
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	20.58	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.147		
MLE of Mean	23.6		
MLE of Standard Deviation	5.202		
nu star	493.9		
Approximate Chi Square Value (.05)	443.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	25.73
Adjusted Chi Square Value	436.1	95% Jackknife UCL	25.92
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.748	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.442	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29.23
		97.5% Chebyshev(Mean, Sd) UCL	31.67
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	36.46
95% Approximate Gamma UCL	26.29		
95% Adjusted Gamma UCL	26.73		

Potential UCL to Use		
	Use 95% Student's-t UCL	25.92
	or 95% Modified-t UCL	25.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.03	Minimum of Log Data	0.0296
Maximum	2.27	Maximum of Log Data	0.82
Mean	1.65	Mean of log Data	0.488
Median	1.65	SD of log Data	0.171
SD	0.264		
Coefficient of Variation	0.16		
Skewness	4.4E-15		

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There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.582
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.787	95% H-UCL	1.816
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.008
95% Adjusted-CLT UCL (Chen-1995)	1.776	97.5% Chebyshev (MVUE) UCL	2.162
95% Modified-t UCL (Johnson-1978)	1.787	99% Chebyshev (MVUE) UCL	2.465
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	29.74	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0555		
MLE of Mean	1.65		
MLE of Standard Deviation	0.303		
nu star	713.9		
Approximate Chi Square Value (.05)	652.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.776
Adjusted Chi Square Value	644	95% Jackknife UCL	1.787
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.737	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.983
		97.5% Chebyshev(Mean, Sd) UCL	2.127
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.409
95% Approximate Gamma UCL	1.804		
95% Adjusted Gamma UCL	1.829		
Potential UCL to Use		Use 95% Student's-t UCL	1.787
		or 95% Modified-t UCL	1.787

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	25.9	Minimum of Log Data	3.254
Maximum	50.8	Maximum of Log Data	3.928
Mean	38.35	Mean of log Data	3.637
Median	38.35	SD of log Data	0.145
SD	5.309		
Coefficient of Variation	0.138		
Skewness	2.5E-15		

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Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.586
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	41.1	95% H-UCL	41.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	45.39
95% Adjusted-CLT UCL (Chen-1995)	40.87	97.5% Chebyshev (MVUE) UCL	48.43
95% Modified-t UCL (Johnson-1978)	41.1	99% Chebyshev (MVUE) UCL	54.41

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	40.59	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.945		
MLE of Mean	38.35		
MLE of Standard Deviation	6.02		
nu star	974.1		
Approximate Chi Square Value (.05)	902.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	40.87
Adjusted Chi Square Value	892.1	95% Jackknife UCL	41.1
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.731	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.435	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	45.03
		97.5% Chebyshev(Mean, Sd) UCL	47.92
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	53.6
95% Approximate Gamma UCL	41.39		
95% Adjusted Gamma UCL	41.87		

Potential UCL to Use			
		Use 95% Student's-t UCL	41.1
		or 95% Modified-t UCL	41.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-07.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.37	Minimum of Log Data	-0.994
Maximum	0.75	Maximum of Log Data	-0.288
Mean	0.56	Mean of log Data	-0.59
Median	0.56	SD of log Data	0.153
SD	0.081		
Coefficient of Variation	0.145		
Skewness	-2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.585
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.602	95% H-UCL	0.609
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.668
95% Adjusted-CLT UCL (Chen-1995)	0.598	97.5% Chebyshev (MVUE) UCL	0.715
95% Modified-t UCL (Johnson-1978)	0.602	99% Chebyshev (MVUE) UCL	0.806
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	36.98	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0151		
MLE of Mean	0.56		
MLE of Standard Deviation	0.0921		
nu star	887.4		
Approximate Chi Square Value (.05)	819.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.598
Adjusted Chi Square Value	809.3	95% Jackknife UCL	0.602
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.733	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.436	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.662
		97.5% Chebyshev(Mean, Sd) UCL	0.706
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.793
95% Approximate Gamma UCL	0.607		
95% Adjusted Gamma UCL	0.614		

Potential UCL to Use		Use 95% Student's-t UCL	0.602
		or 95% Modified-t UCL	0.602

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	7.19	Minimum of Log Data	1.973
Maximum	12.99	Maximum of Log Data	2.564
Mean	10.32	Mean of log Data	2.32
Median	11	SD of log Data	0.182
SD	1.751		
Coefficient of Variation	0.17		
Skewness	-0.575		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.23	95% H-UCL	11.43
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.7
95% Adjusted-CLT UCL (Chen-1995)	11.06	97.5% Chebyshev (MVUE) UCL	13.72
95% Modified-t UCL (Johnson-1978)	11.21	99% Chebyshev (MVUE) UCL	15.74
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	26.15	Data appear Normal at 5% Significance Level	
Theta Star	0.395		
MLE of Mean	10.32		
MLE of Standard Deviation	2.018		
nu star	627.6		
Approximate Chi Square Value (.05)	570.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	11.15
Adjusted Chi Square Value	562.2	95% Jackknife UCL	11.23
		95% Standard Bootstrap UCL	11.14
Anderson-Darling Test Statistic	0.664	95% Bootstrap-t UCL	11.11
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.11
Kolmogorov-Smirnov Test Statistic	0.252	95% Percentile Bootstrap UCL	11.09
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.05
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.52
		97.5% Chebyshev(Mean, Sd) UCL	13.48
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.35
95% Approximate Gamma UCL	11.35		
95% Adjusted Gamma UCL	11.52		
Potential UCL to Use		Use 95% Student's-t UCL	11.23

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.15	Minimum of Log Data	-1.897
Maximum	2.7	Maximum of Log Data	0.993
Mean	1.425	Mean of log Data	0.22
Median	1.425	SD of log Data	0.692
SD	0.544		
Coefficient of Variation	0.382		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.476
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.707	95% H-UCL	2.611
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.946
95% Adjusted-CLT UCL (Chen-1995)	1.683	97.5% Chebyshev (MVUE) UCL	3.552
95% Modified-t UCL (Johnson-1978)	1.707	99% Chebyshev (MVUE) UCL	4.742

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.966	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.48		
MLE of Mean	1.425		
MLE of Standard Deviation	0.827		
nu star	71.18		
Approximate Chi Square Value (.05)	52.76	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.683
Adjusted Chi Square Value	50.34	95% Jackknife UCL	1.707
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.968	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.484	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.109
		97.5% Chebyshev(Mean, Sd) UCL	2.405
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.987
95% Approximate Gamma UCL	1.923		
95% Adjusted Gamma UCL	2.015		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	2.109

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	18.1	Minimum of Log Data	2.896
Maximum	85	Maximum of Log Data	4.443
Mean	58.1	Mean of log Data	3.946
Median	56.89	SD of log Data	0.532
SD	26.24		
Coefficient of Variation	0.452		
Skewness	-0.142		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.862
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	71.7	95% H-UCL	84.63
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.32
95% Adjusted-CLT UCL (Chen-1995)	70.22	97.5% Chebyshev (MVUE) UCL	116.8
95% Modified-t UCL (Johnson-1978)	71.65	99% Chebyshev (MVUE) UCL	151.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.418	Data appear Lognormal at 5% Significance Level	
Theta Star	17		
MLE of Mean	58.1		
MLE of Standard Deviation	31.43		
nu star	82.03		
Approximate Chi Square Value (.05)	62.16	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	70.56
Adjusted Chi Square Value	59.52	95% Jackknife UCL	71.7
		95% Standard Bootstrap UCL	70.07
Anderson-Darling Test Statistic	0.746	95% Bootstrap-t UCL	71.19
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	69.35
Kolmogorov-Smirnov Test Statistic	0.261	95% Percentile Bootstrap UCL	70.15
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	69.62
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	91.11
		97.5% Chebyshev(Mean, Sd) UCL	105.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	133.5
95% Approximate Gamma UCL	76.67		
95% Adjusted Gamma UCL	80.06		

Potential UCL to Use		Use 95% H-UCL	84.63

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Lead

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	17.48	Minimum of Log Data	2.861
Maximum	944	Maximum of Log Data	6.85
Mean	102	Mean of log Data	3.505
Median	25.54	SD of log Data	1.085
SD	265.3		
Coefficient of Variation	2.6		
Skewness	3.459		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.35	Shapiro Wilk Test Statistic	0.538
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	239.5	95% H-UCL	163.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	138.1
95% Adjusted-CLT UCL (Chen-1995)	309.7	97.5% Chebyshev (MVUE) UCL	173.6
95% Modified-t UCL (Johnson-1978)	252.3	99% Chebyshev (MVUE) UCL	243.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.474	Data do not follow a Discernable Distribution (0.05)	
Theta Star	215.3		
MLE of Mean	102		
MLE of Standard Deviation	148.2		
nu star	11.37		
Approximate Chi Square Value (.05)	4.817	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	228
Adjusted Chi Square Value	4.185	95% Jackknife UCL	239.5
		95% Standard Bootstrap UCL	222.8
Anderson-Darling Test Statistic	3.256	95% Bootstrap-t UCL	5803
Anderson-Darling 5% Critical Value	0.78	95% Hall's Bootstrap UCL	2258
Kolmogorov-Smirnov Test Statistic	0.453	95% Percentile Bootstrap UCL	254.7
Kolmogorov-Smirnov 5% Critical Value	0.258	95% BCA Bootstrap UCL	332.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	435.8
		97.5% Chebyshev(Mean, Sd) UCL	580.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	863.9
95% Approximate Gamma UCL	240.9		
95% Adjusted Gamma UCL	277.3		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	435.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	280.3	Minimum of Log Data	5.636
Maximum	909.3	Maximum of Log Data	6.813
Mean	473.6	Mean of log Data	6.076
Median	392.5	SD of log Data	0.417
SD	213.8		
Coefficient of Variation	0.451		
Skewness	1.015		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.891
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	584.5	95% H-UCL	614.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	722.9
95% Adjusted-CLT UCL (Chen-1995)	594.5	97.5% Chebyshev (MVUE) UCL	831.7
95% Modified-t UCL (Johnson-1978)	587.5	99% Chebyshev (MVUE) UCL	1046
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.64	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	102.1		
MLE of Mean	473.6		
MLE of Standard Deviation	219.9		
nu star	111.4		
Approximate Chi Square Value (.05)	88.01	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	575.2
Adjusted Chi Square Value	84.84	95% Jackknife UCL	584.5
		95% Standard Bootstrap UCL	570.3
Anderson-Darling Test Statistic	0.634	95% Bootstrap-t UCL	616.1
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	578.8
Kolmogorov-Smirnov Test Statistic	0.197	95% Percentile Bootstrap UCL	576.3
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	596.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	742.7
		97.5% Chebyshev(Mean, Sd) UCL	859.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1088
95% Approximate Gamma UCL	599.4		
95% Adjusted Gamma UCL	621.7		
Potential UCL to Use		Use 95% Approximate Gamma UCL	599.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0287	Minimum of Log Data	-3.551
Maximum	10	Maximum of Log Data	2.303
Mean	8.189	Mean of log Data	1.531
Median	10	SD of log Data	1.839
SD	3.773		
Coefficient of Variation	0.461		
Skewness	-1.947		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk Test Statistic	0.501
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.15	95% H-UCL	323.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	66.23
95% Adjusted-CLT UCL (Chen-1995)	9.326	97.5% Chebyshev (MVUE) UCL	86.75
95% Modified-t UCL (Johnson-1978)	10.04	99% Chebyshev (MVUE) UCL	127.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.811	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.09		
MLE of Mean	8.189		
MLE of Standard Deviation	9.092		
nu star	19.47		
Approximate Chi Square Value (.05)	10.46	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	9.981
Adjusted Chi Square Value	9.47	95% Jackknife UCL	10.15
		95% Standard Bootstrap UCL	9.838
Anderson-Darling Test Statistic	3.207	95% Bootstrap-t UCL	9.517
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	9.462
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	9.818
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	9.202
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.94
		97.5% Chebyshev(Mean, Sd) UCL	14.99
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.03
95% Approximate Gamma UCL	15.24		
95% Adjusted Gamma UCL	16.84		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.03
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.07	Minimum of Log Data	-2.659
Maximum	1.49	Maximum of Log Data	0.399
Mean	0.78	Mean of log Data	-0.395
Median	0.78	SD of log Data	0.737
SD	0.303		
Coefficient of Variation	0.388		
Skewness	-2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.469
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.937	95% H-UCL	1.529
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.693
95% Adjusted-CLT UCL (Chen-1995)	0.924	97.5% Chebyshev (MVUE) UCL	2.054
95% Modified-t UCL (Johnson-1978)	0.937	99% Chebyshev (MVUE) UCL	2.762

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.726	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.286		
MLE of Mean	0.78		
MLE of Standard Deviation	0.472		
nu star	65.42		
Approximate Chi Square Value (.05)	47.81	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.924
Adjusted Chi Square Value	45.52	95% Jackknife UCL	0.937
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.991	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.161
		97.5% Chebyshev(Mean, Sd) UCL	1.326
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.65
95% Approximate Gamma UCL	1.067		
95% Adjusted Gamma UCL	1.121		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	1.161

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	84.54	Minimum of Log Data	4.437
Maximum	2668	Maximum of Log Data	7.889
Mean	670.3	Mean of log Data	5.972
Median	325.6	SD of log Data	1.055
SD	799.7		
Coefficient of Variation	1.193		
Skewness	1.919		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.723	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1085	95% H-UCL	1785
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1556
95% Adjusted-CLT UCL (Chen-1995)	1187	97.5% Chebyshev (MVUE) UCL	1951
95% Modified-t UCL (Johnson-1978)	1106	99% Chebyshev (MVUE) UCL	2728
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.858	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	781.7		
MLE of Mean	670.3		
MLE of Standard Deviation	723.9		
nu star	20.58		
Approximate Chi Square Value (.05)	11.28	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1050
Adjusted Chi Square Value	10.24	95% Jackknife UCL	1085
		95% Standard Bootstrap UCL	1027
Anderson-Darling Test Statistic	0.501	95% Bootstrap-t UCL	1722
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	2951
Kolmogorov-Smirnov Test Statistic	0.179	95% Percentile Bootstrap UCL	1064
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	1233
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1677
		97.5% Chebyshev(Mean, Sd) UCL	2112
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2967
95% Approximate Gamma UCL	1223		
95% Adjusted Gamma UCL	1347		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1223

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.44	Minimum of Log Data	-0.821
Maximum	10	Maximum of Log Data	2.303
Mean	5.037	Mean of log Data	1.465
Median	5	SD of log Data	0.747
SD	2.04		
Coefficient of Variation	0.405		
Skewness	0.323		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.477
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	6.094	95% H-UCL	10.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.03
95% Adjusted-CLT UCL (Chen-1995)	6.064	97.5% Chebyshev (MVUE) UCL	13.39
95% Modified-t UCL (Johnson-1978)	6.103	99% Chebyshev (MVUE) UCL	18.04
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.64	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.908		
MLE of Mean	5.037		
MLE of Standard Deviation	3.1		
nu star	63.35		
Approximate Chi Square Value (.05)	46.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.005
Adjusted Chi Square Value	43.8	95% Jackknife UCL	6.094
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.955	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.483	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.604
		97.5% Chebyshev(Mean, Sd) UCL	8.714
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.9
95% Approximate Gamma UCL	6.93		
95% Adjusted Gamma UCL	7.285		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	7.604

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.15	Minimum of Log Data	-1.897
Maximum	22.2	Maximum of Log Data	3.1
Mean	10.31	Mean of log Data	2.029
Median	10	SD of log Data	1.257
SD	4.734		
Coefficient of Variation	0.459		
Skewness	0.653		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.444
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.76	95% H-UCL	60.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.22
95% Adjusted-CLT UCL (Chen-1995)	12.83	97.5% Chebyshev (MVUE) UCL	52.5
95% Modified-t UCL (Johnson-1978)	12.8	99% Chebyshev (MVUE) UCL	74.65
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.403	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.344		
MLE of Mean	10.31		
MLE of Standard Deviation	8.7		
nu star	33.68		
Approximate Chi Square Value (.05)	21.41	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.55
Adjusted Chi Square Value	19.93	95% Jackknife UCL	12.76
		95% Standard Bootstrap UCL	12.44
Anderson-Darling Test Statistic	2.968	95% Bootstrap-t UCL	12.72
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	14.63
Kolmogorov-Smirnov Test Statistic	0.5	95% Percentile Bootstrap UCL	12.34
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	12.48
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	16.26
		97.5% Chebyshev(Mean, Sd) UCL	18.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.9
95% Approximate Gamma UCL	16.21		
95% Adjusted Gamma UCL	17.42		

Potential UCL to Use — Use 95% Chebyshev (Mean, Sd) UCL 16.26

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0262	Minimum of Log Data	-3.642
Maximum	0.0631	Maximum of Log Data	-2.762
Mean	0.0447	Mean of log Data	-3.124
Median	0.0447	SD of log Data	0.191
SD	0.00788		
Coefficient of Variation	0.176		
Skewness	3.2E-15		

Warning: There are only 3 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.578
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0488	95% H-UCL	0.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.056
95% Adjusted-CLT UCL (Chen-1995)	0.0484	97.5% Chebyshev (MVUE) UCL	0.06
95% Modified-t UCL (Johnson-1978)	0.0488	99% Chebyshev (MVUE) UCL	0.069

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	24.18	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00185		
MLE of Mean	0.0447		
MLE of Standard Deviation	0.00908		
nu star	580.3		
Approximate Chi Square Value (.05)	525.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.048
Adjusted Chi Square Value	517.5	95% Jackknife UCL	0.049
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.743	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.055
		97.5% Chebyshev(Mean, Sd) UCL	0.059
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.067
95% Approximate Gamma UCL	0.0493		
95% Adjusted Gamma UCL	0.0501		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.049
		or 95% Modified-t UCL	0.049

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	48.47	Minimum of Log Data	3.881
Maximum	762.9	Maximum of Log Data	6.637
Mean	184.2	Mean of log Data	4.865
Median	105.7	SD of log Data	0.802
SD	200.8		
Coefficient of Variation	1.09		
Skewness	2.529		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.663	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	288.3	95% H-UCL	332.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	356.4
95% Adjusted-CLT UCL (Chen-1995)	324.7	97.5% Chebyshev (MVUE) UCL	435.7
95% Modified-t UCL (Johnson-1978)	295.3	99% Chebyshev (MVUE) UCL	591.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.233	Data appear Lognormal at 5% Significance Level	
Theta Star	149.4		
MLE of Mean	184.2		
MLE of Standard Deviation	165.9		
nu star	29.58		
Approximate Chi Square Value (.05)	18.17	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	279.5
Adjusted Chi Square Value	16.81	95% Jackknife UCL	288.3
		95% Standard Bootstrap UCL	276.5
Anderson-Darling Test Statistic	0.783	95% Bootstrap-t UCL	433.7
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	608.6
Kolmogorov-Smirnov Test Statistic	0.291	95% Percentile Bootstrap UCL	281.1
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	326.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	436.8
		97.5% Chebyshev(Mean, Sd) UCL	546.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	760.8
95% Approximate Gamma UCL	300		
95% Adjusted Gamma UCL	324.1		
Potential UCL to Use		Use 95% H-UCL	332.9

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.26	Minimum of Log Data	1.66
Maximum	12.8	Maximum of Log Data	2.549
Mean	9.03	Mean of log Data	2.185
Median	9.03	SD of log Data	0.193
SD	1.608		
Coefficient of Variation	0.178		
Skewness	-2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.577
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.863	95% H-UCL	10.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.25
95% Adjusted-CLT UCL (Chen-1995)	9.793	97.5% Chebyshev (MVUE) UCL	12.2
95% Modified-t UCL (Johnson-1978)	9.863	99% Chebyshev (MVUE) UCL	14.08
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	23.68	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.381		
MLE of Mean	9.03		
MLE of Standard Deviation	1.856		
nu star	568.2		
Approximate Chi Square Value (.05)	513.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	9.793
Adjusted Chi Square Value	506	95% Jackknife UCL	9.863
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.743	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.44	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.05
		97.5% Chebyshev(Mean, Sd) UCL	11.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.65
95% Approximate Gamma UCL	9.984		
95% Adjusted Gamma UCL	10.14		
Potential UCL to Use		Use 95% Student's-t UCL	9.863
		or 95% Modified-t UCL	9.863

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.366	Minimum of Log Data	-1.005
Maximum	0.96	Maximum of Log Data	-0.041
Mean	0.663	Mean of log Data	-0.43
Median	0.663	SD of log Data	0.21
SD	0.127		
Coefficient of Variation	0.191		
Skewness	-5E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.729	95% H-UCL	0.748
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.84
95% Adjusted-CLT UCL (Chen-1995)	0.723	97.5% Chebyshev (MVUE) UCL	0.917
95% Modified-t UCL (Johnson-1978)	0.729	99% Chebyshev (MVUE) UCL	1.067

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	20.27	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0327		
MLE of Mean	0.663		
MLE of Standard Deviation	0.147		
nu star	486.5		
Approximate Chi Square Value (.05)	436.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.723
Adjusted Chi Square Value	429.1	95% Jackknife UCL	0.729
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.748	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.442	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.822
		97.5% Chebyshev(Mean, Sd) UCL	0.891
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.027
95% Approximate Gamma UCL	0.739		
95% Adjusted Gamma UCL	0.752		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.729
	or 95% Modified-t UCL	0.729

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	7.8	Minimum of Log Data	2.054
Maximum	21.3	Maximum of Log Data	3.059
Mean	14.55	Mean of log Data	2.657
Median	14.55	SD of log Data	0.219
SD	2.878		
Coefficient of Variation	0.198		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.572
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16.04	95% H-UCL	16.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.62
95% Adjusted-CLT UCL (Chen-1995)	15.92	97.5% Chebyshev (MVUE) UCL	20.37
95% Modified-t UCL (Johnson-1978)	16.04	99% Chebyshev (MVUE) UCL	23.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.75	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.776		
MLE of Mean	14.55		
MLE of Standard Deviation	3.36		
nu star	449.9		
Approximate Chi Square Value (.05)	401.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	15.92
Adjusted Chi Square Value	394.8	95% Jackknife UCL	16.04
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.751	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.443	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.17
		97.5% Chebyshev(Mean, Sd) UCL	19.74
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22.82
95% Approximate Gamma UCL	16.29		
95% Adjusted Gamma UCL	16.58		

Potential UCL to Use		
	Use 95% Student's-t UCL	16.04
	or 95% Modified-t UCL	16.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	14-08.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.33	Minimum of Log Data	-1.109
Maximum	0.61	Maximum of Log Data	-0.494
Mean	0.47	Mean of log Data	-0.763
Median	0.47	SD of log Data	0.132
SD	0.0597		
Coefficient of Variation	0.127		
Skewness	5.115E-15		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.588
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.501	95% H-UCL	0.505
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.548
95% Adjusted-CLT UCL (Chen-1995)	0.498	97.5% Chebyshev (MVUE) UCL	0.582
95% Modified-t UCL (Johnson-1978)	0.501	99% Chebyshev (MVUE) UCL	0.649

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	48.61	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00967		
MLE of Mean	0.47		
MLE of Standard Deviation	0.0674		
nu star	1167		
Approximate Chi Square Value (.05)	1088	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.498
Adjusted Chi Square Value	1077	95% Jackknife UCL	0.501
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.728	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.433	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.545
		97.5% Chebyshev(Mean, Sd) UCL	0.578
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.641
95% Approximate Gamma UCL	0.504		
95% Adjusted Gamma UCL	0.509		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.501
	or 95% Modified-t UCL	0.501

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	6	Minimum of Log Data	1.792
Maximum	16.62	Maximum of Log Data	2.811
Mean	10.66	Mean of log Data	2.33
Median	10.68	SD of log Data	0.282
SD	2.948		
Coefficient of Variation	0.277		
Skewness	0.479		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.961	Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.18	95% H-UCL	12.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.48
95% Adjusted-CLT UCL (Chen-1995)	12.18	97.5% Chebyshev (MVUE) UCL	16.13
95% Modified-t UCL (Johnson-1978)	12.2	99% Chebyshev (MVUE) UCL	19.37
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.69	Data appear Normal at 5% Significance Level	
Theta Star	0.997		
MLE of Mean	10.66		
MLE of Standard Deviation	3.259		
nu star	256.6		
Approximate Chi Square Value (.05)	220.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.05
Adjusted Chi Square Value	215.4	95% Jackknife UCL	12.18
		95% Standard Bootstrap UCL	12.05
Anderson-Darling Test Statistic	0.264	95% Bootstrap-t UCL	12.38
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	12.6
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	11.99
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	12.13
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.36
		97.5% Chebyshev(Mean, Sd) UCL	15.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.12
95% Approximate Gamma UCL	12.4		
95% Adjusted Gamma UCL	12.69		
Potential UCL to Use		Use 95% Student's-t UCL	12.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	12.9	Minimum of Log Data	2.557
Maximum	85	Maximum of Log Data	4.443
Mean	50.75	Mean of log Data	3.82
Median	44.25	SD of log Data	0.516
SD	22.78		
Coefficient of Variation	0.449		
Skewness	0.524		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.86	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	62.56	95% H-UCL	72.93
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.74
95% Adjusted-CLT UCL (Chen-1995)	62.63	97.5% Chebyshev (MVUE) UCL	100.6
95% Modified-t UCL (Johnson-1978)	62.72	99% Chebyshev (MVUE) UCL	129.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.695	Data appear Normal at 5% Significance Level	
Theta Star	13.73		
MLE of Mean	50.75		
MLE of Standard Deviation	26.4		
nu star	88.69		
Approximate Chi Square Value (.05)	67.98	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	61.56
Adjusted Chi Square Value	65.21	95% Jackknife UCL	62.56
		95% Standard Bootstrap UCL	61.09
Anderson-Darling Test Statistic	0.656	95% Bootstrap-t UCL	63.38
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	62.7
Kolmogorov-Smirnov Test Statistic	0.188	95% Percentile Bootstrap UCL	61.1
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	61.69
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	79.41
		97.5% Chebyshev(Mean, Sd) UCL	91.81
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	116.2
95% Approximate Gamma UCL	66.21		
95% Adjusted Gamma UCL	69.02		
Potential UCL to Use		Use 95% Student's-t UCL	62.56

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	11.7	Minimum of Log Data	2.46
Maximum	276.8	Maximum of Log Data	5.623
Mean	72.55	Mean of log Data	3.947
Median	39.48	SD of log Data	0.831
SD	72.55		
Coefficient of Variation	1		
Skewness	2.332		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.718	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	110.2	95% H-UCL	140.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	148.2
95% Adjusted-CLT UCL (Chen-1995)	122.1	97.5% Chebyshev (MVUE) UCL	181.9
95% Modified-t UCL (Johnson-1978)	112.5	99% Chebyshev (MVUE) UCL	247.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.278	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	56.79		
MLE of Mean	72.55		
MLE of Standard Deviation	64.18		
nu star	30.66		
Approximate Chi Square Value (.05)	19.01	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	107
Adjusted Chi Square Value	17.63	95% Jackknife UCL	110.2
		95% Standard Bootstrap UCL	104.9
Anderson-Darling Test Statistic	0.56	95% Bootstrap-t UCL	152.1
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	248.1
Kolmogorov-Smirnov Test Statistic	0.247	95% Percentile Bootstrap UCL	107.5
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	124.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	163.8
		97.5% Chebyshev(Mean, Sd) UCL	203.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	280.9
95% Approximate Gamma UCL	117		
95% Adjusted Gamma UCL	126.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	117

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0266	Minimum of Log Data	-3.627
Maximum	10	Maximum of Log Data	2.303
Mean	8.766	Mean of log Data	1.764
Median	10	SD of log Data	1.7
SD	2.85		
Coefficient of Variation	0.325		
Skewness	-3.077		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.503	Shapiro Wilk Test Statistic	0.36
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.24	95% H-UCL	225.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	65.67
95% Adjusted-CLT UCL (Chen-1995)	9.338	97.5% Chebyshev (MVUE) UCL	85.59
95% Modified-t UCL (Johnson-1978)	10.12	99% Chebyshev (MVUE) UCL	124.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.085	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.079		
MLE of Mean	8.766		
MLE of Standard Deviation	8.415		
nu star	26.04		
Approximate Chi Square Value (.05)	15.41	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	10.12
Adjusted Chi Square Value	14.17	95% Jackknife UCL	10.24
		95% Standard Bootstrap UCL	10.05
Anderson-Darling Test Statistic	3.733	95% Bootstrap-t UCL	9.775
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	9.617
Kolmogorov-Smirnov Test Statistic	0.484	95% Percentile Bootstrap UCL	9.772
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	9.608
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.35
		97.5% Chebyshev(Mean, Sd) UCL	13.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.95
95% Approximate Gamma UCL	14.81		
95% Adjusted Gamma UCL	16.1		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	16.95
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.006	Minimum of Log Data	-5.116
Maximum	0.88	Maximum of Log Data	-0.128
Mean	0.443	Mean of log Data	-1.115
Median	0.443	SD of log Data	1.275
SD	0.186		
Coefficient of Variation	0.421		
Skewness	2.106E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.417
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.54	95% H-UCL	2.772
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.826
95% Adjusted-CLT UCL (Chen-1995)	0.531	97.5% Chebyshev (MVUE) UCL	2.328
95% Modified-t UCL (Johnson-1978)	0.54	99% Chebyshev (MVUE) UCL	3.315
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.412	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.314		
MLE of Mean	0.443		
MLE of Standard Deviation	0.373		
nu star	33.88		
Approximate Chi Square Value (.05)	21.57	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.531
Adjusted Chi Square Value	20.08	95% Jackknife UCL	0.54
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.261	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.515	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.677
		97.5% Chebyshev(Mean, Sd) UCL	0.779
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.978
95% Approximate Gamma UCL	0.696		
95% Adjusted Gamma UCL	0.747		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.677

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	112.5	Minimum of Log Data	4.723
Maximum	1300	Maximum of Log Data	7.17
Mean	502.6	Mean of log Data	6.033
Median	429.5	SD of log Data	0.656
SD	327.6		
Coefficient of Variation	0.652		
Skewness	1.427		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.988
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	672.5	95% H-UCL	822
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	939.3
95% Adjusted-CLT UCL (Chen-1995)	699.8	97.5% Chebyshev (MVUE) UCL	1127
95% Modified-t UCL (Johnson-1978)	679	99% Chebyshev (MVUE) UCL	1495
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.177	Data appear Normal at 5% Significance Level	
Theta Star	230.9		
MLE of Mean	502.6		
MLE of Standard Deviation	340.7		
nu star	52.24		
Approximate Chi Square Value (.05)	36.64	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	658.2
Adjusted Chi Square Value	34.65	95% Jackknife UCL	672.5
		95% Standard Bootstrap UCL	649.7
Anderson-Darling Test Statistic	0.169	95% Bootstrap-t UCL	757.3
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	1479
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	656.9
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	695.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	914.9
		97.5% Chebyshev(Mean, Sd) UCL	1093
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1444
95% Approximate Gamma UCL	716.7		
95% Adjusted Gamma UCL	757.7		
Potential UCL to Use		Use 95% Student's-t UCL	672.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	5	Maximum of Log Data	1.609
Mean	4.205	Mean of log Data	1.07
Median	5	SD of log Data	1.284
SD	1.857		
Coefficient of Variation	0.442		
Skewness	-2.059		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.47	Shapiro Wilk Test Statistic	0.487
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.168	95% H-UCL	25.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.47
95% Adjusted-CLT UCL (Chen-1995)	4.746	97.5% Chebyshev (MVUE) UCL	21.02
95% Modified-t UCL (Johnson-1978)	5.115	99% Chebyshev (MVUE) UCL	29.94
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.188	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.541		
MLE of Mean	4.205		
MLE of Standard Deviation	3.859		
nu star	28.5		
Approximate Chi Square Value (.05)	17.32	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.087
Adjusted Chi Square Value	16	95% Jackknife UCL	5.168
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.439	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.521	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.542
		97.5% Chebyshev(Mean, Sd) UCL	7.554
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.54
95% Approximate Gamma UCL	6.92		
95% Adjusted Gamma UCL	7.49		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.542
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.036	Minimum of Log Data	-3.324
Maximum	11.8	Maximum of Log Data	2.468
Mean	8.461	Mean of log Data	1.421
Median	10	SD of log Data	2.093
SD	3.966		
Coefficient of Variation	0.469		
Skewness	-1.963		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.559	Shapiro Wilk Test Statistic	0.492
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.52	95% H-UCL	964.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.69
95% Adjusted-CLT UCL (Chen-1995)	9.65	97.5% Chebyshev (MVUE) UCL	123.7
95% Modified-t UCL (Johnson-1978)	10.41	99% Chebyshev (MVUE) UCL	182.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.676	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.52		
MLE of Mean	8.461		
MLE of Standard Deviation	10.29		
nu star	16.22		
Approximate Chi Square Value (.05)	8.115	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	10.34
Adjusted Chi Square Value	7.256	95% Jackknife UCL	10.52
		95% Standard Bootstrap UCL	10.31
Anderson-Darling Test Statistic	3.481	95% Bootstrap-t UCL	9.932
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	9.732
Kolmogorov-Smirnov Test Statistic	0.521	95% Percentile Bootstrap UCL	10.15
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	9.969
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.45
		97.5% Chebyshev(Mean, Sd) UCL	15.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.85
95% Approximate Gamma UCL	16.91		
95% Adjusted Gamma UCL	18.91		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	19.85
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0077	Minimum of Log Data	-4.867
Maximum	0.0628	Maximum of Log Data	-2.768
Mean	0.0352	Mean of log Data	-3.424
Median	0.0352	SD of log Data	0.484
SD	0.0117		
Coefficient of Variation	0.333		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.513
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0413	95% H-UCL	0.0499
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0587
95% Adjusted-CLT UCL (Chen-1995)	0.0408	97.5% Chebyshev (MVUE) UCL	0.0685
95% Modified-t UCL (Johnson-1978)	0.0413	99% Chebyshev (MVUE) UCL	0.0876
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.948	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00712		
MLE of Mean	0.0352		
MLE of Standard Deviation	0.0158		
nu star	118.8		
Approximate Chi Square Value (.05)	94.59	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.0408
Adjusted Chi Square Value	91.3	95% Jackknife UCL	0.0413
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.862	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.469	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.05
		97.5% Chebyshev(Mean, Sd) UCL	0.0564
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.0689
95% Approximate Gamma UCL	0.0442		
95% Adjusted Gamma UCL	0.0458		
Potential UCL to Use		Use 95% Student's-t UCL	0.0413
		or 95% Modified-t UCL	0.0413

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	638.1	Maximum of Log Data	6.459
Mean	195.1	Mean of log Data	4.473
Median	64.74	SD of log Data	1.423
SD	224.6		
Coefficient of Variation	1.151		
Skewness	1.027		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.79	Shapiro Wilk Test Statistic	0.927
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	311.5	95% H-UCL	1197
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	619.1
95% Adjusted-CLT UCL (Chen-1995)	322.3	97.5% Chebyshev (MVUE) UCL	796.4
95% Modified-t UCL (Johnson-1978)	314.7	99% Chebyshev (MVUE) UCL	1145
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.617	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	316.3		
MLE of Mean	195.1		
MLE of Standard Deviation	248.4		
nu star	14.8		
Approximate Chi Square Value (.05)	7.126	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	301.7
Adjusted Chi Square Value	6.329	95% Jackknife UCL	311.5
		95% Standard Bootstrap UCL	297.2
Anderson-Darling Test Statistic	0.613	95% Bootstrap-t UCL	350.7
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	287.1
Kolmogorov-Smirnov Test Statistic	0.227	95% Percentile Bootstrap UCL	304.4
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	314.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	477.7
		97.5% Chebyshev(Mean, Sd) UCL	599.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	840.1
95% Approximate Gamma UCL	405.3		
95% Adjusted Gamma UCL	456.3		
Potential UCL to Use		Use 95% Approximate Gamma UCL	405.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.04	Minimum of Log Data	-3.219
Maximum	0.238	Maximum of Log Data	-1.435
Mean	0.139	Mean of log Data	-2.032
Median	0.139	SD of log Data	0.404
SD	0.0422		
Coefficient of Variation	0.304		
Skewness	1.101E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.53
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.161	95% H-UCL	0.182
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.214
95% Adjusted-CLT UCL (Chen-1995)	0.159	97.5% Chebyshev (MVUE) UCL	0.246
95% Modified-t UCL (Johnson-1978)	0.161	99% Chebyshev (MVUE) UCL	0.308
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.536	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0213		
MLE of Mean	0.139		
MLE of Standard Deviation	0.0544		
nu star	156.9		
Approximate Chi Square Value (.05)	128.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.159
Adjusted Chi Square Value	125	95% Jackknife UCL	0.161
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.825	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.192
		97.5% Chebyshev(Mean, Sd) UCL	0.215
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.26
95% Approximate Gamma UCL	0.169		
95% Adjusted Gamma UCL	0.174		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.161
		or 95% Modified-t UCL	0.161

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.91	Minimum of Log Data	-0.0943
Maximum	5.92	Maximum of Log Data	1.778
Mean	3.415	Mean of log Data	1.164
Median	3.415	SD of log Data	0.427
SD	1.068		
Coefficient of Variation	0.313		
Skewness	1.431E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.525
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.969	95% H-UCL	4.568
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.379
95% Adjusted-CLT UCL (Chen-1995)	3.922	97.5% Chebyshev (MVUE) UCL	6.202
95% Modified-t UCL (Johnson-1978)	3.969	99% Chebyshev (MVUE) UCL	7.817

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.004	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.569		
MLE of Mean	3.415		
MLE of Standard Deviation	1.394		
nu star	144.1		
Approximate Chi Square Value (.05)	117.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	3.922
Adjusted Chi Square Value	113.7	95% Jackknife UCL	3.969
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.835	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.759
		97.5% Chebyshev(Mean, Sd) UCL	5.341
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6.483
95% Approximate Gamma UCL	4.193		
95% Adjusted Gamma UCL	4.329		

Potential UCL to Use			
		Use 95% Student's-t UCL	3.969
		or 95% Modified-t UCL	3.969

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-09.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.85	Minimum of Log Data	1.766
Maximum	23.57	Maximum of Log Data	3.16
Mean	11.32	Mean of log Data	2.363
Median	11	SD of log Data	0.36
SD	4.63		
Coefficient of Variation	0.409		
Skewness	1.791		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.829	Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	13.72	95% H-UCL	14.06
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.44
95% Adjusted-CLT UCL (Chen-1995)	14.25	97.5% Chebyshev (MVUE) UCL	18.68
95% Modified-t UCL (Johnson-1978)	13.83	99% Chebyshev (MVUE) UCL	23.08
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.069	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.865		
MLE of Mean	11.32		
MLE of Standard Deviation	4.593		
nu star	145.6		
Approximate Chi Square Value (.05)	118.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	13.51
Adjusted Chi Square Value	115.1	95% Jackknife UCL	13.72
		95% Standard Bootstrap UCL	13.42
Anderson-Darling Test Statistic	0.474	95% Bootstrap-t UCL	15.42
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	23.91
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	13.52
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	14.13
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.14
		97.5% Chebyshev(Mean, Sd) UCL	19.66
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.62
95% Approximate Gamma UCL	13.88		
95% Adjusted Gamma UCL	14.32		
Potential UCL to Use		Use 95% Approximate Gamma UCL	13.88

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cadmium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.19	Minimum of Log Data	-1.661
Maximum	0.62	Maximum of Log Data	-0.478
Mean	0.405	Mean of log Data	-0.931
Median	0.405	SD of log Data	0.26
SD	0.0917		
Coefficient of Variation	0.226		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.563
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.453	95% H-UCL	0.473
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.54
95% Adjusted-CLT UCL (Chen-1995)	0.449	97.5% Chebyshev (MVUE) UCL	0.598
95% Modified-t UCL (Johnson-1978)	0.453	99% Chebyshev (MVUE) UCL	0.712

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.77	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0294		
MLE of Mean	0.405		
MLE of Standard Deviation	0.109		
nu star	330.6		
Approximate Chi Square Value (.05)	289.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.449
Adjusted Chi Square Value	283.6	95% Jackknife UCL	0.453
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.765	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.448	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.52
		97.5% Chebyshev(Mean, Sd) UCL	0.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.668
95% Approximate Gamma UCL	0.463		
95% Adjusted Gamma UCL	0.472		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.453
	or 95% Modified-t UCL	0.453

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	32.35	Minimum of Log Data	3.477
Maximum	85	Maximum of Log Data	4.443
Mean	52.63	Mean of log Data	3.874
Median	38.17	SD of log Data	0.431
SD	24.2		
Coefficient of Variation	0.46		
Skewness	0.732		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.705	Shapiro Wilk Test Statistic	0.746
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	65.17	95% H-UCL	69.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.3
95% Adjusted-CLT UCL (Chen-1995)	65.7	97.5% Chebyshev (MVUE) UCL	93.82
95% Modified-t UCL (Johnson-1978)	65.42	99% Chebyshev (MVUE) UCL	118.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.359	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.08		
MLE of Mean	52.63		
MLE of Standard Deviation	25.21		
nu star	104.6		
Approximate Chi Square Value (.05)	82	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	64.12
Adjusted Chi Square Value	78.95	95% Jackknife UCL	65.17
		95% Standard Bootstrap UCL	63.65
Anderson-Darling Test Statistic	1.529	95% Bootstrap-t UCL	70.12
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	61.04
Kolmogorov-Smirnov Test Statistic	0.298	95% Percentile Bootstrap UCL	64.53
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.08
		97.5% Chebyshev(Mean, Sd) UCL	96.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	122.1
95% Approximate Gamma UCL	67.13		
95% Adjusted Gamma UCL	69.73		

Potential UCL to Use		
	Use 95% Student's-t UCL	65.17
	or 95% Modified-t UCL	65.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	1.13	Minimum of Log Data	0.122
Maximum	10	Maximum of Log Data	2.303
Mean	9.261	Mean of log Data	2.121
Median	10	SD of log Data	0.629
SD	2.561		
Coefficient of Variation	0.276		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.59	95% H-UCL	15.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.15
95% Adjusted-CLT UCL (Chen-1995)	9.687	97.5% Chebyshev (MVUE) UCL	21.69
95% Modified-t UCL (Johnson-1978)	10.47	99% Chebyshev (MVUE) UCL	28.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.751	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.469		
MLE of Mean	9.261		
MLE of Standard Deviation	4.782		
nu star	90.01		
Approximate Chi Square Value (.05)	69.14	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.48
Adjusted Chi Square Value	66.35	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.142	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.543	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.48
		97.5% Chebyshev(Mean, Sd) UCL	13.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.62
95% Approximate Gamma UCL	12.06		
95% Adjusted Gamma UCL	12.56		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.48

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	2.99	Minimum of Log Data	1.095
Maximum	16	Maximum of Log Data	2.773
Mean	9.495	Mean of log Data	2.198
Median	9.495	SD of log Data	0.378
SD	2.774		
Coefficient of Variation	0.292		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.536
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.93	95% H-UCL	12.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.26
95% Adjusted-CLT UCL (Chen-1995)	10.81	97.5% Chebyshev (MVUE) UCL	16.26
95% Modified-t UCL (Johnson-1978)	10.93	99% Chebyshev (MVUE) UCL	20.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.304		
MLE of Mean	9.495		
MLE of Standard Deviation	3.519		
nu star	174.7		
Approximate Chi Square Value (.05)	145.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.81
Adjusted Chi Square Value	141	95% Jackknife UCL	10.93
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.813	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.99
		97.5% Chebyshev(Mean, Sd) UCL	14.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.46
95% Approximate Gamma UCL	11.43		
95% Adjusted Gamma UCL	11.76		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.93
	or 95% Modified-t UCL	10.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	147.3	Minimum of Log Data	4.993
Maximum	1725	Maximum of Log Data	7.453
Mean	538.1	Mean of log Data	5.992
Median	327.7	SD of log Data	0.757
SD	495.5		
Coefficient of Variation	0.921		
Skewness	1.792		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.733	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	795	95% H-UCL	943.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1034
95% Adjusted-CLT UCL (Chen-1995)	852.5	97.5% Chebyshev (MVUE) UCL	1258
95% Modified-t UCL (Johnson-1978)	807.3	99% Chebyshev (MVUE) UCL	1697
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.434	Data appear Lognormal at 5% Significance Level	
Theta Star	375.2		
MLE of Mean	538.1		
MLE of Standard Deviation	449.3		
nu star	34.42		
Approximate Chi Square Value (.05)	22	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	773.4
Adjusted Chi Square Value	20.5	95% Jackknife UCL	795
		95% Standard Bootstrap UCL	769.2
Anderson-Darling Test Statistic	0.784	95% Bootstrap-t UCL	1199
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	1934
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	770.5
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	871.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1162
		97.5% Chebyshev(Mean, Sd) UCL	1431
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1961
95% Approximate Gamma UCL	841.9		
95% Adjusted Gamma UCL	903.7		
Potential UCL to Use		Use 95% H-UCL	943.4

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	10	Maximum of Log Data	2.303
Mean	5.833	Mean of log Data	1.725
Median	5	SD of log Data	0.27
SD	1.946		
Coefficient of Variation	0.334		
Skewness	2.055		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.465	Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.842	95% H-UCL	6.793
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.787
95% Adjusted-CLT UCL (Chen-1995)	7.114	97.5% Chebyshev (MVUE) UCL	8.645
95% Modified-t UCL (Johnson-1978)	6.898	99% Chebyshev (MVUE) UCL	10.33

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.887	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.59		
MLE of Mean	5.833		
MLE of Standard Deviation	1.855		
nu star	237.3		
Approximate Chi Square Value (.05)	202.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.757
Adjusted Chi Square Value	197.7	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.442	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.282
		97.5% Chebyshev(Mean, Sd) UCL	9.342
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.42
95% Approximate Gamma UCL	6.831		
95% Adjusted Gamma UCL	7		

Potential UCL to Use		
	Use 95% Student's-t UCL	6.842
	or 95% Modified-t UCL	6.898

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	166	Minimum of Log Data	5.112
Maximum	215	Maximum of Log Data	5.371
Mean	190.5	Mean of log Data	5.248
Median	190.5	SD of log Data	0.055
SD	10.45		
Coefficient of Variation	0.0548		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	195.9	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	203.7
95% Adjusted-CLT UCL (Chen-1995)	195.5	97.5% Chebyshev (MVUE) UCL	209.5
95% Modified-t UCL (Johnson-1978)	195.9	99% Chebyshev (MVUE) UCL	220.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	270	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.706		
MLE of Mean	190.5		
MLE of Standard Deviation	11.59		
nu star	6480		
Approximate Chi Square Value (.05)	6294	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	195.5
Adjusted Chi Square Value	6266	95% Jackknife UCL	195.9
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.716	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	203.6
		97.5% Chebyshev(Mean, Sd) UCL	209.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	220.5
95% Approximate Gamma UCL	196.1		
95% Adjusted Gamma UCL	197		

Potential UCL to Use		
	Use 95% Student's-t UCL	195.9
	or 95% Modified-t UCL	195.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	21.77	Minimum of Log Data	3.081
Maximum	4600	Maximum of Log Data	8.434
Mean	665	Mean of log Data	5.562
Median	275.1	SD of log Data	1.37
SD	1266		
Coefficient of Variation	1.904		
Skewness	3.216		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.503	Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1321	95% H-UCL	2978
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1687
95% Adjusted-CLT UCL (Chen-1995)	1629	97.5% Chebyshev (MVUE) UCL	2164
95% Modified-t UCL (Johnson-1978)	1378	99% Chebyshev (MVUE) UCL	3101
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.544	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1223		
MLE of Mean	665		
MLE of Standard Deviation	901.9		
nu star	13.05		
Approximate Chi Square Value (.05)	5.925	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1266
Adjusted Chi Square Value	5.21	95% Jackknife UCL	1321
		95% Standard Bootstrap UCL	1239
Anderson-Darling Test Statistic	0.72	95% Bootstrap-t UCL	3554
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	3359
Kolmogorov-Smirnov Test Statistic	0.252	95% Percentile Bootstrap UCL	1362
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	1711
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2258
		97.5% Chebyshev(Mean, Sd) UCL	2947
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4302
95% Approximate Gamma UCL	1464		
95% Adjusted Gamma UCL	1665		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1464

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	43.2	Minimum of Log Data	3.766
Maximum	1070	Maximum of Log Data	6.975
Mean	556.6	Mean of log Data	6.163
Median	556.6	SD of log Data	0.778
SD	218.9		
Coefficient of Variation	0.393		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.464
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	670.1	95% H-UCL	1165
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1264
95% Adjusted-CLT UCL (Chen-1995)	660.5	97.5% Chebyshev (MVUE) UCL	1541
95% Modified-t UCL (Johnson-1978)	670.1	99% Chebyshev (MVUE) UCL	2085

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.539	Data do not follow a Discernable Distribution (0.05)	
Theta Star	219.2		
MLE of Mean	556.6		
MLE of Standard Deviation	349.3		
nu star	60.93		
Approximate Chi Square Value (.05)	43.98	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	660.5
Adjusted Chi Square Value	41.79	95% Jackknife UCL	670.1
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.013	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.49	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	832.1
		97.5% Chebyshev(Mean, Sd) UCL	951.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1185
95% Approximate Gamma UCL	771.1		
95% Adjusted Gamma UCL	811.5		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	832.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	3.32	Minimum of Log Data	1.2
Maximum	70	Maximum of Log Data	4.248
Mean	36.66	Mean of log Data	3.455
Median	36.66	SD of log Data	0.734
SD	14.22		
Coefficient of Variation	0.388		
Skewness	2.8E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.47
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	44.03	95% H-UCL	71.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.35
95% Adjusted-CLT UCL (Chen-1995)	43.41	97.5% Chebyshev (MVUE) UCL	96.21
95% Modified-t UCL (Johnson-1978)	44.03	99% Chebyshev (MVUE) UCL	129.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.738	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.39		
MLE of Mean	36.66		
MLE of Standard Deviation	22.15		
nu star	65.72		
Approximate Chi Square Value (.05)	48.07	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	43.41
Adjusted Chi Square Value	45.77	95% Jackknife UCL	44.03
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.99	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	54.55
		97.5% Chebyshev(Mean, Sd) UCL	62.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	77.49
95% Approximate Gamma UCL	50.12		
95% Adjusted Gamma UCL	52.64		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	54.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	73.5	Minimum of Log Data	4.297
Maximum	1540	Maximum of Log Data	7.34
Mean	806.8	Mean of log Data	6.547
Median	806.8	SD of log Data	0.733
SD	312.7		
Coefficient of Variation	0.388		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.47
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	968.8	95% H-UCL	1571
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1743
95% Adjusted-CLT UCL (Chen-1995)	955.2	97.5% Chebyshev (MVUE) UCL	2113
95% Modified-t UCL (Johnson-1978)	968.8	99% Chebyshev (MVUE) UCL	2840

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.747	Data do not follow a Discernable Distribution (0.05)	
Theta Star	293.7		
MLE of Mean	806.8		
MLE of Standard Deviation	486.8		
nu star	65.92		
Approximate Chi Square Value (.05)	48.24	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	955.2
Adjusted Chi Square Value	45.94	95% Jackknife UCL	968.8
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.989	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1200
		97.5% Chebyshev(Mean, Sd) UCL	1370
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1705
95% Approximate Gamma UCL	1102		
95% Adjusted Gamma UCL	1158		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1200

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-10.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.21	Minimum of Log Data	-1.561
Maximum	1.1	Maximum of Log Data	0.095
Mean	0.75	Mean of log Data	-0.343
Median	0.75	SD of log Data	0.402
SD	0.202		
Coefficient of Variation	0.27		
Skewness	-1.419		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.673	Shapiro Wilk Test Statistic	0.541
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.855	95% H-UCL	0.984
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.157
95% Adjusted-CLT UCL (Chen-1995)	0.82	97.5% Chebyshev (MVUE) UCL	1.327
95% Modified-t UCL (Johnson-1978)	0.851	99% Chebyshev (MVUE) UCL	1.661
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.954	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.108		
MLE of Mean	0.75		
MLE of Standard Deviation	0.284		
nu star	166.9		
Approximate Chi Square Value (.05)	138	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.846
Adjusted Chi Square Value	134	95% Jackknife UCL	0.855
		95% Standard Bootstrap UCL	0.841
Anderson-Darling Test Statistic	2.429	95% Bootstrap-t UCL	0.837
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	0.839
Kolmogorov-Smirnov Test Statistic	0.461	95% Percentile Bootstrap UCL	0.838
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	0.824
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.005
		97.5% Chebyshev(Mean, Sd) UCL	1.115
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.331
95% Approximate Gamma UCL	0.907		
95% Adjusted Gamma UCL	0.934		
Potential UCL to Use		Use 95% Student's-t UCL	0.855
		or 95% Modified-t UCL	0.851

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.2	Minimum of Log Data	1.825
Maximum	14.57	Maximum of Log Data	2.679
Mean	10.25	Mean of log Data	2.3
Median	10.82	SD of log Data	0.249
SD	2.439		
Coefficient of Variation	0.238		
Skewness	0.049		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.51	95% H-UCL	11.85
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.49
95% Adjusted-CLT UCL (Chen-1995)	11.42	97.5% Chebyshev (MVUE) UCL	14.89
95% Modified-t UCL (Johnson-1978)	11.52	99% Chebyshev (MVUE) UCL	17.64
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	13.86	Data appear Normal at 5% Significance Level	
Theta Star	0.74		
MLE of Mean	10.25		
MLE of Standard Deviation	2.753		
nu star	332.6		
Approximate Chi Square Value (.05)	291.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.41
Adjusted Chi Square Value	285.4	95% Jackknife UCL	11.51
		95% Standard Bootstrap UCL	11.36
Anderson-Darling Test Statistic	0.39	95% Bootstrap-t UCL	11.49
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	11.45
Kolmogorov-Smirnov Test Statistic	0.178	95% Percentile Bootstrap UCL	11.41
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.38
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.32
		97.5% Chebyshev(Mean, Sd) UCL	14.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.26
95% Approximate Gamma UCL	11.7		
95% Adjusted Gamma UCL	11.94		
Potential UCL to Use		Use 95% Student's-t UCL	11.51

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	104	Minimum of Log Data	4.644
Maximum	172	Maximum of Log Data	5.147
Mean	131	Mean of log Data	4.869
Median	131	SD of log Data	0.113
SD	15.39		
Coefficient of Variation	0.117		
Skewness	1.391		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.673	Shapiro Wilk Test Statistic	0.701
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	139	95% H-UCL	139.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	149.6
95% Adjusted-CLT UCL (Chen-1995)	140.2	97.5% Chebyshev (MVUE) UCL	157.6
95% Modified-t UCL (Johnson-1978)	139.3	99% Chebyshev (MVUE) UCL	173.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	63.09	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.076		
MLE of Mean	131		
MLE of Standard Deviation	16.49		
nu star	1514		
Approximate Chi Square Value (.05)	1425	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	138.3
Adjusted Chi Square Value	1412	95% Jackknife UCL	139
		95% Standard Bootstrap UCL	138
Anderson-Darling Test Statistic	2.033	95% Bootstrap-t UCL	140.7
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	183
Kolmogorov-Smirnov Test Statistic	0.402	95% Percentile Bootstrap UCL	137.8
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	139
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	150.4
		97.5% Chebyshev(Mean, Sd) UCL	158.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	175.2
95% Approximate Gamma UCL	139.2		
95% Adjusted Gamma UCL	140.5		
Potential UCL to Use		Use 95% Student's-t UCL	139
		or 95% Modified-t UCL	139.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	32.24	Minimum of Log Data	3.473
Maximum	85	Maximum of Log Data	4.443
Mean	53.99	Mean of log Data	3.911
Median	41.48	SD of log Data	0.402
SD	23.14		
Coefficient of Variation	0.429		
Skewness	0.739		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.72	Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	65.98	95% H-UCL	69.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.39
95% Adjusted-CLT UCL (Chen-1995)	66.5	97.5% Chebyshev (MVUE) UCL	93.35
95% Modified-t UCL (Johnson-1978)	66.22	99% Chebyshev (MVUE) UCL	116.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.997	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.8		
MLE of Mean	53.99		
MLE of Standard Deviation	24.15		
nu star	119.9		
Approximate Chi Square Value (.05)	95.64	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	64.97
Adjusted Chi Square Value	92.33	95% Jackknife UCL	65.98
		95% Standard Bootstrap UCL	64.79
Anderson-Darling Test Statistic	1.455	95% Bootstrap-t UCL	71.33
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	61.83
Kolmogorov-Smirnov Test Statistic	0.298	95% Percentile Bootstrap UCL	65.41
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	65.98
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.1
		97.5% Chebyshev(Mean, Sd) UCL	95.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	120.4
95% Approximate Gamma UCL	67.7		
95% Adjusted Gamma UCL	70.12		
Potential UCL to Use		Use 95% Student's-t UCL	65.98
		or 95% Modified-t UCL	66.22

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	35	Minimum of Log Data	3.555
Maximum	275.7	Maximum of Log Data	5.619
Mean	93.22	Mean of log Data	4.314
Median	68.39	SD of log Data	0.674
SD	70.94		
Coefficient of Variation	0.761		
Skewness	1.737		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.81	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	130	95% H-UCL	152.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	172.7
95% Adjusted-CLT UCL (Chen-1995)	137.9	97.5% Chebyshev (MVUE) UCL	207.7
95% Modified-t UCL (Johnson-1978)	131.7	99% Chebyshev (MVUE) UCL	276.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.869	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	49.88		
MLE of Mean	93.22		
MLE of Standard Deviation	68.19		
nu star	44.85		
Approximate Chi Square Value (.05)	30.49	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	126.9
Adjusted Chi Square Value	28.69	95% Jackknife UCL	130
		95% Standard Bootstrap UCL	125.9
Anderson-Darling Test Statistic	0.405	95% Bootstrap-t UCL	151.9
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	272.1
Kolmogorov-Smirnov Test Statistic	0.151	95% Percentile Bootstrap UCL	126.9
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	136.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	182.5
		97.5% Chebyshev(Mean, Sd) UCL	221.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	297
95% Approximate Gamma UCL	137.1		
95% Adjusted Gamma UCL	145.7		
Potential UCL to Use		Use 95% Approximate Gamma UCL	137.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	7471	Minimum of Log Data	8.919
Maximum	39015	Maximum of Log Data	10.57
Mean	21960	Mean of log Data	9.903
Median	19928	SD of log Data	0.471
SD	9569		
Coefficient of Variation	0.436		
Skewness	0.558		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.949	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	26921	95% H-UCL	30096
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	35467
95% Adjusted-CLT UCL (Chen-1995)	26979	97.5% Chebyshev (MVUE) UCL	41250
95% Modified-t UCL (Johnson-1978)	26995	99% Chebyshev (MVUE) UCL	52609
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.155	Data appear Normal at 5% Significance Level	
Theta Star	5285		
MLE of Mean	21960		
MLE of Standard Deviation	10773		
nu star	99.73		
Approximate Chi Square Value (.05)	77.69	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	26503
Adjusted Chi Square Value	74.72	95% Jackknife UCL	26921
		95% Standard Bootstrap UCL	26257
Anderson-Darling Test Statistic	0.185	95% Bootstrap-t UCL	27507
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	28091
Kolmogorov-Smirnov Test Statistic	0.123	95% Percentile Bootstrap UCL	26696
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	26520
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34001
		97.5% Chebyshev(Mean, Sd) UCL	39211
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	49445
95% Approximate Gamma UCL	28189		
95% Adjusted Gamma UCL	29307		
Potential UCL to Use		Use 95% Student's-t UCL	26921

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	120.4	Minimum of Log Data	4.791
Maximum	1063	Maximum of Log Data	6.969
Mean	581.3	Mean of log Data	6.256
Median	547.4	SD of log Data	0.547
SD	249.7		
Coefficient of Variation	0.43		
Skewness	0.481		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.824
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	710.7	95% H-UCL	869.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1018
95% Adjusted-CLT UCL (Chen-1995)	710.6	97.5% Chebyshev (MVUE) UCL	1201
95% Modified-t UCL (Johnson-1978)	712.4	99% Chebyshev (MVUE) UCL	1559
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.601	Data appear Normal at 5% Significance Level	
Theta Star	161.4		
MLE of Mean	581.3		
MLE of Standard Deviation	306.3		
nu star	86.42		
Approximate Chi Square Value (.05)	65.99	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	699.9
Adjusted Chi Square Value	63.28	95% Jackknife UCL	710.7
		95% Standard Bootstrap UCL	696.1
Anderson-Darling Test Statistic	0.621	95% Bootstrap-t UCL	726.6
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	827.2
Kolmogorov-Smirnov Test Statistic	0.182	95% Percentile Bootstrap UCL	696.7
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	706
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	895.5
		97.5% Chebyshev(Mean, Sd) UCL	1031
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1299
95% Approximate Gamma UCL	761.2		
95% Adjusted Gamma UCL	793.9		
Potential UCL to Use		Use 95% Student's-t UCL	710.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.92	Minimum of Log Data	-0.083
Maximum	43.71	Maximum of Log Data	3.778
Mean	11.86	Mean of log Data	2.206
Median	10	SD of log Data	0.842
SD	10.36		
Coefficient of Variation	0.873		
Skewness	3.032		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.492	Shapiro Wilk Test Statistic	0.614
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	17.23	95% H-UCL	25.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.41
95% Adjusted-CLT UCL (Chen-1995)	19.58	97.5% Chebyshev (MVUE) UCL	32.44
95% Modified-t UCL (Johnson-1978)	17.67	99% Chebyshev (MVUE) UCL	44.28
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.573	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.541		
MLE of Mean	11.86		
MLE of Standard Deviation	9.458		
nu star	37.76		
Approximate Chi Square Value (.05)	24.69	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	16.78
Adjusted Chi Square Value	23.08	95% Jackknife UCL	17.23
		95% Standard Bootstrap UCL	16.72
Anderson-Darling Test Statistic	2.398	95% Bootstrap-t UCL	56.48
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	69.96
Kolmogorov-Smirnov Test Statistic	0.415	95% Percentile Bootstrap UCL	17.54
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	18.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24.9
		97.5% Chebyshev(Mean, Sd) UCL	30.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.61
95% Approximate Gamma UCL	18.14		
95% Adjusted Gamma UCL	19.4		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	24.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.073	Minimum of Log Data	-2.617
Maximum	2.64	Maximum of Log Data	0.971
Mean	1.357	Mean of log Data	0.117
Median	1.357	SD of log Data	0.882
SD	0.547		
Coefficient of Variation	0.403		
Skewness	-1E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.451
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.64	95% H-UCL	3.407
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.461
95% Adjusted-CLT UCL (Chen-1995)	1.616	97.5% Chebyshev (MVUE) UCL	4.27
95% Modified-t UCL (Johnson-1978)	1.64	99% Chebyshev (MVUE) UCL	5.859
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.167	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.626		
MLE of Mean	1.357		
MLE of Standard Deviation	0.922		
nu star	52		
Approximate Chi Square Value (.05)	36.44	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.616
Adjusted Chi Square Value	34.46	95% Jackknife UCL	1.64
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.066	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.496	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.045
		97.5% Chebyshev(Mean, Sd) UCL	2.343
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.928
95% Approximate Gamma UCL	1.936		
95% Adjusted Gamma UCL	2.047		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	2.045

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	950.8	Maximum of Log Data	6.857
Mean	413.2	Mean of log Data	5.659
Median	427.1	SD of log Data	0.962
SD	321.1		
Coefficient of Variation	0.777		
Skewness	0.537		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.873	Shapiro Wilk Test Statistic	0.889
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	579.6	95% H-UCL	1040
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	991.3
95% Adjusted-CLT UCL (Chen-1995)	581	97.5% Chebyshev (MVUE) UCL	1233
95% Modified-t UCL (Johnson-1978)	582	99% Chebyshev (MVUE) UCL	1708
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.192	Data appear Normal at 5% Significance Level	
Theta Star	346.5		
MLE of Mean	413.2		
MLE of Standard Deviation	378.4		
nu star	28.62		
Approximate Chi Square Value (.05)	17.41	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	565.6
Adjusted Chi Square Value	16.09	95% Jackknife UCL	579.6
		95% Standard Bootstrap UCL	563
Anderson-Darling Test Statistic	0.597	95% Bootstrap-t UCL	607.3
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	565.6
Kolmogorov-Smirnov Test Statistic	0.23	95% Percentile Bootstrap UCL	572.9
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	571.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	817.2
		97.5% Chebyshev(Mean, Sd) UCL	992
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1335
95% Approximate Gamma UCL	679.2		
95% Adjusted Gamma UCL	735		
Potential UCL to Use		Use 95% Student's-t UCL	579.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.1	Minimum of Log Data	0.095
Maximum	10	Maximum of Log Data	2.303
Mean	5.925	Mean of log Data	1.657
Median	5	SD of log Data	0.581
SD	2.696		
Coefficient of Variation	0.455		
Skewness	0.47		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.743	Shapiro Wilk Test Statistic	0.692
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.323	95% H-UCL	9.188
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.7
95% Adjusted-CLT UCL (Chen-1995)	7.318	97.5% Chebyshev (MVUE) UCL	12.69
95% Modified-t UCL (Johnson-1978)	7.34	99% Chebyshev (MVUE) UCL	16.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.233	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.833		
MLE of Mean	5.925		
MLE of Standard Deviation	3.295		
nu star	77.59		
Approximate Chi Square Value (.05)	58.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	7.205
Adjusted Chi Square Value	55.76	95% Jackknife UCL	7.323
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	1.615	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.347	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.317
		97.5% Chebyshev(Mean, Sd) UCL	10.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.67
95% Approximate Gamma UCL	7.886		
95% Adjusted Gamma UCL	8.246		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	9.317

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.048	Minimum of Log Data	-3.037
Maximum	10.71	Maximum of Log Data	2.371
Mean	7.589	Mean of log Data	1.169
Median	10	SD of log Data	2.085
SD	4.509		
Coefficient of Variation	0.594		
Skewness	-1.319		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.594
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.927	95% H-UCL	719.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	71.75
95% Adjusted-CLT UCL (Chen-1995)	9.201	97.5% Chebyshev (MVUE) UCL	94.68
95% Modified-t UCL (Johnson-1978)	9.844	99% Chebyshev (MVUE) UCL	139.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.583	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.01		
MLE of Mean	7.589		
MLE of Standard Deviation	9.935		
nu star	14		
Approximate Chi Square Value (.05)	6.574	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	9.73
Adjusted Chi Square Value	5.814	95% Jackknife UCL	9.927
		95% Standard Bootstrap UCL	9.658
Anderson-Darling Test Statistic	2.888	95% Bootstrap-t UCL	9.712
Anderson-Darling 5% Critical Value	0.769	95% Hall's Bootstrap UCL	8.932
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	9.298
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	9.239
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.26
		97.5% Chebyshev(Mean, Sd) UCL	15.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.54
95% Approximate Gamma UCL	16.17		
95% Adjusted Gamma UCL	18.28		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.54

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
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and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.0078	Minimum of Log Data	-4.854
Maximum	0.272	Maximum of Log Data	-1.304
Mean	0.14	Mean of log Data	-2.154
Median	0.14	SD of log Data	0.872
SD	0.0562		
Coefficient of Variation	0.403		
Skewness	8E-16		

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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.452
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.169	95% H-UCL	0.344
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.352
95% Adjusted-CLT UCL (Chen-1995)	0.166	97.5% Chebyshev (MVUE) UCL	0.434
95% Modified-t UCL (Johnson-1978)	0.169	99% Chebyshev (MVUE) UCL	0.595
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.199	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0635		
MLE of Mean	0.14		
MLE of Standard Deviation	0.0942		
nu star	52.78		
Approximate Chi Square Value (.05)	37.09	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.166
Adjusted Chi Square Value	35.09	95% Jackknife UCL	0.169
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.061	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.495	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.21
		97.5% Chebyshev(Mean, Sd) UCL	0.241
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.301
95% Approximate Gamma UCL	0.199		
95% Adjusted Gamma UCL	0.21		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
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and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		**Log-transformed Statistics**	
Minimum	14.07	Minimum of Log Data	2.644
Maximum	542	Maximum of Log Data	6.295
Mean	192	Mean of log Data	4.703
Median	194.2	SD of log Data	1.272
SD	168.8		
Coefficient of Variation	0.879		
Skewness	0.782		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.898	Shapiro Wilk Test Statistic	0.893
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	279.5	95% H-UCL	924.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	611.4
95% Adjusted-CLT UCL (Chen-1995)	283.9	97.5% Chebyshev (MVUE) UCL	779.4
95% Modified-t UCL (Johnson-1978)	281.4	99% Chebyshev (MVUE) UCL	1110
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.833	Data appear Normal at 5% Significance Level	
Theta Star	230.6		
MLE of Mean	192		
MLE of Standard Deviation	210.4		
nu star	19.99		
Approximate Chi Square Value (.05)	10.84	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	272.2
Adjusted Chi Square Value	9.829	95% Jackknife UCL	279.5
		95% Standard Bootstrap UCL	268.7
Anderson-Darling Test Statistic	0.442	95% Bootstrap-t UCL	299.2
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	292.3
Kolmogorov-Smirnov Test Statistic	0.212	95% Percentile Bootstrap UCL	271.7
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	283.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	404.4
		97.5% Chebyshev(Mean, Sd) UCL	496.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	676.8
95% Approximate Gamma UCL	354		
95% Adjusted Gamma UCL	390.5		
Potential UCL to Use		Use 95% Student's-t UCL	279.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.63	Minimum of Log Data	0.967
Maximum	24.2	Maximum of Log Data	3.186
Mean	13.42	Mean of log Data	2.51
Median	13.42	SD of log Data	0.515
SD	4.599		
Coefficient of Variation	0.343		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
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However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.507
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15.8	95% H-UCL	19.63
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23.08
95% Adjusted-CLT UCL (Chen-1995)	15.6	97.5% Chebyshev (MVUE) UCL	27.07
95% Modified-t UCL (Johnson-1978)	15.8	99% Chebyshev (MVUE) UCL	34.89
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.506	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.977		
MLE of Mean	13.42		
MLE of Standard Deviation	6.32		
nu star	108.1		
Approximate Chi Square Value (.05)	85.15	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	15.6
Adjusted Chi Square Value	82.04	95% Jackknife UCL	15.8
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.877	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.2
		97.5% Chebyshev(Mean, Sd) UCL	21.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.62
95% Approximate Gamma UCL	17.04		
95% Adjusted Gamma UCL	17.68		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	19.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.196	Minimum of Log Data	-1.63
Maximum	1.76	Maximum of Log Data	0.565
Mean	0.978	Mean of log Data	-0.107
Median	0.978	SD of log Data	0.508
SD	0.333		
Coefficient of Variation	0.341		
Skewness	1.8E-15		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.508
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.151	95% H-UCL	1.421
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.672
95% Adjusted-CLT UCL (Chen-1995)	1.136	97.5% Chebyshev (MVUE) UCL	1.959
95% Modified-t UCL (Johnson-1978)	1.151	99% Chebyshev (MVUE) UCL	2.521
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.589	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.213		
MLE of Mean	0.978		
MLE of Standard Deviation	0.457		
nu star	110.1		
Approximate Chi Square Value (.05)	86.92	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	1.136
Adjusted Chi Square Value	83.78	95% Jackknife UCL	1.151
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.874	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.398
		97.5% Chebyshev(Mean, Sd) UCL	1.579
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.936
95% Approximate Gamma UCL	1.239		
95% Adjusted Gamma UCL	1.286		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.398

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	4.79	Minimum of Log Data	1.567
Maximum	40.9	Maximum of Log Data	3.711
Mean	22.85	Mean of log Data	3.047
Median	22.85	SD of log Data	0.495
SD	7.699		
Coefficient of Variation	0.337		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
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Those methods will return a 'N/A' value on your output display!

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.511
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	26.84	95% H-UCL	32.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.55
95% Adjusted-CLT UCL (Chen-1995)	26.5	97.5% Chebyshev (MVUE) UCL	45.05
95% Modified-t UCL (Johnson-1978)	26.84	99% Chebyshev (MVUE) UCL	57.81
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.77	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.79		
MLE of Mean	22.85		
MLE of Standard Deviation	10.46		
nu star	114.5		
Approximate Chi Square Value (.05)	90.77	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	26.5
Adjusted Chi Square Value	87.56	95% Jackknife UCL	26.84
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.868	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.47	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	32.53
		97.5% Chebyshev(Mean, Sd) UCL	36.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	44.96
95% Approximate Gamma UCL	28.81		
95% Adjusted Gamma UCL	29.87		
Potential UCL to Use		Use 95% Student's-t UCL	26.84
		or 95% Modified-t UCL	26.84

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	14-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Americium-241

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics
Minimum	-0.0025	Log Statistics Not Available
Maximum	1.65	
Mean	0.824	
Median	0.824	
SD	0.352	
Coefficient of Variation	0.428	
Skewness	-1.1E-15	

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Not Available	
Shapiro Wilk Critical Value	0.859		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.006	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1.006	95% Adjusted-CLT UCL (Chen 1995)	0.991
		95% Modified-t UCL (Johnson-1978)	1.006

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	1.267	95% CLT UCL	0.991
		95% Jackknife UCL	1.006
		95% Standard Bootstrap UCL	N/A
		95% Bootstrap-t UCL	N/A
		95% Hall's Bootstrap UCL	N/A
		95% Percentile Bootstrap UCL	N/A
		95% BCA Bootstrap UCL	N/A
		95% Chebyshev(Mean, Sd) UCL	1.267
		97.5% Chebyshev(Mean, Sd) UCL	1.459
		99% Chebyshev(Mean, Sd) UCL	1.836

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6
Raw Statistics		Log-transformed Statistics	
Minimum	4.1	Minimum of Log Data	1.411
Maximum	12.07	Maximum of Log Data	2.491
Mean	9.726	Mean of log Data	2.235
Median	11	SD of log Data	0.319
SD	2.417		
Coefficient of Variation	0.249		
Skewness	-1.537		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.747	Shapiro Wilk Test Statistic	0.694
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.98	95% H-UCL	11.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13.77
95% Adjusted-CLT UCL (Chen-1995)	10.54	97.5% Chebyshev (MVUE) UCL	15.5
95% Modified-t UCL (Johnson-1978)	10.93	99% Chebyshev (MVUE) UCL	18.88
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.703	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.002		
MLE of Mean	9.726		
MLE of Standard Deviation	3.122		
nu star	232.9		
Approximate Chi Square Value (.05)	198.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.87
Adjusted Chi Square Value	193.7	95% Jackknife UCL	10.98
		95% Standard Bootstrap UCL	10.82
Anderson-Darling Test Statistic	1.661	95% Bootstrap-t UCL	10.71
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	10.54
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	10.82
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	10.57
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.77
		97.5% Chebyshev(Mean, Sd) UCL	14.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.67
95% Approximate Gamma UCL	11.41		
95% Adjusted Gamma UCL	11.69		
Potential UCL to Use		Use 95% Student's-t UCL	10.98
		or 95% Modified-t UCL	10.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	12.7	Minimum of Log Data	2.542
Maximum	85	Maximum of Log Data	4.443
Mean	64.49	Mean of log Data	4.059
Median	74.29	SD of log Data	0.559
SD	24.47		
Coefficient of Variation	0.379		
Skewness	-0.86		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.723
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	77.18	95% H-UCL	98.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	115.1
95% Adjusted-CLT UCL (Chen-1995)	74.24	97.5% Chebyshev (MVUE) UCL	136
95% Modified-t UCL (Johnson-1978)	76.88	99% Chebyshev (MVUE) UCL	177.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.676	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.55		
MLE of Mean	64.49		
MLE of Standard Deviation	33.64		
nu star	88.22		
Approximate Chi Square Value (.05)	67.56	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	76.11
Adjusted Chi Square Value	64.81	95% Jackknife UCL	77.18
		95% Standard Bootstrap UCL	75.8
Anderson-Darling Test Statistic	1.1	95% Bootstrap-t UCL	75.69
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	74.25
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	75.54
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	74.44
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.28
		97.5% Chebyshev(Mean, Sd) UCL	108.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	134.8
95% Approximate Gamma UCL	84.21		
95% Adjusted Gamma UCL	87.78		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	95.28

Recommended UCL exceeds the maximum observation

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	10986	Minimum of Log Data	9.304
Maximum	29681	Maximum of Log Data	10.3
Mean	16281	Mean of log Data	9.664
Median	15612	SD of log Data	0.26
SD	4874		
Coefficient of Variation	0.299		
Skewness	2.019		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.807	Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18808	95% H-UCL	18880
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	21575
95% Adjusted-CLT UCL (Chen-1995)	19471	97.5% Chebyshev (MVUE) UCL	23886
95% Modified-t UCL (Johnson-1978)	18945	99% Chebyshev (MVUE) UCL	28424
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.33	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1437		
MLE of Mean	16281		
MLE of Standard Deviation	4837		
nu star	271.9		
Approximate Chi Square Value (.05)	234.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	18595
Adjusted Chi Square Value	229.4	95% Jackknife UCL	18808
		95% Standard Bootstrap UCL	18515
Anderson-Darling Test Statistic	0.491	95% Bootstrap-t UCL	20562
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	29591
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	18578
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	19621
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22414
		97.5% Chebyshev(Mean, Sd) UCL	25068
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30281
95% Approximate Gamma UCL	18861		
95% Adjusted Gamma UCL	19294		
Potential UCL to Use		Use 95% Approximate Gamma UCL	18861

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	0.273	Maximum of Log Data	-1.298
Mean	0.147	Mean of log Data	-2.035
Median	0.147	SD of log Data	0.618
SD	0.0539		
Coefficient of Variation	0.368		
Skewness	-2.7E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.488
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.174	95% H-UCL	0.243
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.28
95% Adjusted-CLT UCL (Chen-1995)	0.172	97.5% Chebyshev (MVUE) UCL	0.334
95% Modified-t UCL (Johnson-1978)	0.174	99% Chebyshev (MVUE) UCL	0.44
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.463	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0423		
MLE of Mean	0.147		
MLE of Standard Deviation	0.0787		
nu star	83.11		
Approximate Chi Square Value (.05)	63.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	0.172
Adjusted Chi Square Value	60.45	95% Jackknife UCL	0.174
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.93	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.214
		97.5% Chebyshev(Mean, Sd) UCL	0.244
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.301
95% Approximate Gamma UCL	0.193		
95% Adjusted Gamma UCL	0.201		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.214

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	65	Minimum of Log Data	4.174
Maximum	304	Maximum of Log Data	5.717
Mean	105.1	Mean of log Data	4.541
Median	82.73	SD of log Data	0.446
SD	66.76		
Coefficient of Variation	0.635		
Skewness	2.786		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.621	Shapiro Wilk Test Statistic	0.795
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	139.7	95% H-UCL	137
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	161.4
95% Adjusted-CLT UCL (Chen-1995)	153.4	97.5% Chebyshev (MVUE) UCL	186.9
95% Modified-t UCL (Johnson-1978)	142.3	99% Chebyshev (MVUE) UCL	236.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.461	Data do not follow a Discernable Distribution (0.05)	
Theta Star	30.37		
MLE of Mean	105.1		
MLE of Standard Deviation	56.5		
nu star	83.06		
Approximate Chi Square Value (.05)	63.05	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	136.8
Adjusted Chi Square Value	60.4	95% Jackknife UCL	139.7
		95% Standard Bootstrap UCL	135.7
Anderson-Darling Test Statistic	1.124	95% Bootstrap-t UCL	187.2
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	250.2
Kolmogorov-Smirnov Test Statistic	0.249	95% Percentile Bootstrap UCL	140.4
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	156.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	189.1
		97.5% Chebyshev(Mean, Sd) UCL	225.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	296.9
95% Approximate Gamma UCL	138.4		
95% Adjusted Gamma UCL	144.5		
Potential UCL to Use		Use 95% Student's-t UCL	139.7
		or 95% Modified-t UCL	142.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2
Raw Statistics		Log-transformed Statistics	
Minimum	0.5	Minimum of Log Data	-0.693
Maximum	5	Maximum of Log Data	1.609
Mean	4.625	Mean of log Data	1.418
Median	5	SD of log Data	0.665
SD	1.299		
Coefficient of Variation	0.281		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.298	95% H-UCL	8.264
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	9.414
95% Adjusted-CLT UCL (Chen-1995)	4.841	97.5% Chebyshev (MVUE) UCL	11.31
95% Modified-t UCL (Johnson-1978)	5.236	99% Chebyshev (MVUE) UCL	15.03
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.467	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.334		
MLE of Mean	4.625		
MLE of Standard Deviation	2.484		
nu star	83.22		
Approximate Chi Square Value (.05)	63.19	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.242
Adjusted Chi Square Value	60.54	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.148	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.544	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.26
		97.5% Chebyshev(Mean, Sd) UCL	6.967
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.356
95% Approximate Gamma UCL	6.091		
95% Adjusted Gamma UCL	6.358		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.26
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	16.69	Maximum of Log Data	2.815
Mean	9.725	Mean of log Data	1.803
Median	10	SD of log Data	1.896
SD	3.612		
Coefficient of Variation	0.371		
Skewness	-1.337		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.581	Shapiro Wilk Test Statistic	0.373
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.6	95% H-UCL	549.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.32
95% Adjusted-CLT UCL (Chen-1995)	11.01	97.5% Chebyshev (MVUE) UCL	126.4
95% Modified-t UCL (Johnson-1978)	11.53	99% Chebyshev (MVUE) UCL	185.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.956	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.18		
MLE of Mean	9.725		
MLE of Standard Deviation	9.949		
nu star	22.93		
Approximate Chi Square Value (.05)	13.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.44
Adjusted Chi Square Value	11.92	95% Jackknife UCL	11.6
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.736	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.549	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.27
		97.5% Chebyshev(Mean, Sd) UCL	16.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.1
95% Approximate Gamma UCL	17.1		
95% Adjusted Gamma UCL	18.72		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	20.1

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.75	Minimum of Log Data	-0.288
Maximum	406	Maximum of Log Data	6.006
Mean	203.4	Mean of log Data	4.906
Median	203.4	SD of log Data	1.648
SD	86.4		
Coefficient of Variation	0.425		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.398
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	248.2	95% H-UCL	4236
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1390
95% Adjusted-CLT UCL (Chen-1995)	244.4	97.5% Chebyshev (MVUE) UCL	1807
95% Modified-t UCL (Johnson-1978)	248.2	99% Chebyshev (MVUE) UCL	2627
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.079	Data do not follow a Discernable Distribution (0.05)	
Theta Star	188.5		
MLE of Mean	203.4		
MLE of Standard Deviation	195.8		
nu star	25.89		
Approximate Chi Square Value (.05)	15.29	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	244.4
Adjusted Chi Square Value	14.06	95% Jackknife UCL	248.2
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.431	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.53	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.25	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	312.1
		97.5% Chebyshev(Mean, Sd) UCL	359.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	451.5
95% Approximate Gamma UCL	344.3		
95% Adjusted Gamma UCL	374.4		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) UCL	451.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9
Raw Statistics		Log-transformed Statistics	
Minimum	5.05	Minimum of Log Data	1.619
Maximum	174.9	Maximum of Log Data	5.164
Mean	35.03	Mean of log Data	3.063
Median	20	SD of log Data	0.93
SD	47.83		
Coefficient of Variation	1.365		
Skewness	2.73		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.879
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	59.82	95% H-UCL	72.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	70.6
95% Adjusted-CLT UCL (Chen-1995)	69.36	97.5% Chebyshev (MVUE) UCL	87.55
95% Modified-t UCL (Johnson-1978)	61.63	99% Chebyshev (MVUE) UCL	120.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.92	Data appear Lognormal at 5% Significance Level	
Theta Star	38.07		
MLE of Mean	35.03		
MLE of Standard Deviation	36.52		
nu star	22.08		
Approximate Chi Square Value (.05)	12.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	57.73
Adjusted Chi Square Value	11.3	95% Jackknife UCL	59.82
		95% Standard Bootstrap UCL	57.31
Anderson-Darling Test Statistic	1.291	95% Bootstrap-t UCL	187.4
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	214.1
Kolmogorov-Smirnov Test Statistic	0.339	95% Percentile Bootstrap UCL	58.5
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	72.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.21
		97.5% Chebyshev(Mean, Sd) UCL	121.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	172.4
95% Approximate Gamma UCL	62.38		
95% Adjusted Gamma UCL	68.41		
Potential UCL to Use		Use 95% H-UCL	72.14

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.2	Minimum of Log Data	1.825
Maximum	25.82	Maximum of Log Data	3.251
Mean	11.83	Mean of log Data	2.401
Median	11	SD of log Data	0.375
SD	5.193		
Coefficient of Variation	0.439		
Skewness	1.982		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.75	Shapiro Wilk Test Statistic	0.869
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	14.53	95% H-UCL	14.84
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.4
95% Adjusted-CLT UCL (Chen-1995)	15.22	97.5% Chebyshev (MVUE) UCL	19.83
95% Modified-t UCL (Johnson-1978)	14.67	99% Chebyshev (MVUE) UCL	24.62
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.514	Data appear Lognormal at 5% Significance Level	
Theta Star	2.146		
MLE of Mean	11.83		
MLE of Standard Deviation	5.04		
nu star	132.3		
Approximate Chi Square Value (.05)	106.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	14.3
Adjusted Chi Square Value	103.3	95% Jackknife UCL	14.53
		95% Standard Bootstrap UCL	14.2
Anderson-Darling Test Statistic	1.003	95% Bootstrap-t UCL	17.27
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	29.72
Kolmogorov-Smirnov Test Statistic	0.307	95% Percentile Bootstrap UCL	14.47
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	15.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	18.37
		97.5% Chebyshev(Mean, Sd) UCL	21.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	26.75
95% Approximate Gamma UCL	14.67		
95% Adjusted Gamma UCL	15.17		
Potential UCL to Use		Use 95% Student's-t UCL	14.53
		or 95% Modified-t UCL	14.67
		or 95% H-UCL	14.84

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Beryllium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	36.91	Minimum of Log Data	3.608
Maximum	85	Maximum of Log Data	4.443
Mean	58.12	Mean of log Data	4.019
Median	54.51	SD of log Data	0.306
SD	18.25		
Coefficient of Variation	0.314		
Skewness	0.605		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.867	Shapiro Wilk Test Statistic	0.907
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	67.58	95% H-UCL	69.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	80.67
95% Adjusted-CLT UCL (Chen-1995)	67.77	97.5% Chebyshev (MVUE) UCL	90.45
95% Modified-t UCL (Johnson-1978)	67.73	99% Chebyshev (MVUE) UCL	109.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.767	Data appear Normal at 5% Significance Level	
Theta Star	6.63		
MLE of Mean	58.12		
MLE of Standard Deviation	19.63		
nu star	210.4		
Approximate Chi Square Value (.05)	177.8	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	66.79
Adjusted Chi Square Value	173.3	95% Jackknife UCL	67.58
		95% Standard Bootstrap UCL	66.5
Anderson-Darling Test Statistic	0.502	95% Bootstrap-t UCL	69.51
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	66.06
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	66.6
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	67.62
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	81.08
		97.5% Chebyshev(Mean, Sd) UCL	91.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	110.5
95% Approximate Gamma UCL	68.77		
95% Adjusted Gamma UCL	70.58		
Potential UCL to Use		Use 95% Student's-t UCL	67.58

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	24.29	Minimum of Log Data	3.19
Maximum	258.3	Maximum of Log Data	5.554
Mean	131.5	Mean of log Data	4.601
Median	121.9	SD of log Data	0.854
SD	86.57		
Coefficient of Variation	0.658		
Skewness	0.197		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.874
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	176.4	95% H-UCL	284.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	294.7
95% Adjusted-CLT UCL (Chen-1995)	174.1	97.5% Chebyshev (MVUE) UCL	362.6
95% Modified-t UCL (Johnson-1978)	176.6	99% Chebyshev (MVUE) UCL	495.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.517	Data appear Normal at 5% Significance Level	
Theta Star	86.72		
MLE of Mean	131.5		
MLE of Standard Deviation	106.8		
nu star	36.4		
Approximate Chi Square Value (.05)	23.59	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	172.6
Adjusted Chi Square Value	22.03	95% Jackknife UCL	176.4
		95% Standard Bootstrap UCL	171
Anderson-Darling Test Statistic	0.575	95% Bootstrap-t UCL	177.1
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	169.5
Kolmogorov-Smirnov Test Statistic	0.195	95% Percentile Bootstrap UCL	173.5
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	169.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	240.4
		97.5% Chebyshev(Mean, Sd) UCL	287.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	380.2
95% Approximate Gamma UCL	202.9		
95% Adjusted Gamma UCL	217.3		
Potential UCL to Use		Use 95% Student's-t UCL	176.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	13510	Minimum of Log Data	9.511
Maximum	52658	Maximum of Log Data	10.87
Mean	32092	Mean of log Data	10.33
Median	30621	SD of log Data	0.34
SD	9829		
Coefficient of Variation	0.306		
Skewness	0.25		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.972	Shapiro Wilk Test Statistic	0.928
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	37188	95% H-UCL	39619
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46176
95% Adjusted-CLT UCL (Chen-1995)	36978	97.5% Chebyshev (MVUE) UCL	52209
95% Modified-t UCL (Johnson-1978)	37222	99% Chebyshev (MVUE) UCL	64059
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.938	Data appear Normal at 5% Significance Level	
Theta Star	4043		
MLE of Mean	32092		
MLE of Standard Deviation	11390		
nu star	190.5		
Approximate Chi Square Value (.05)	159.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	36760
Adjusted Chi Square Value	155.3	95% Jackknife UCL	37188
		95% Standard Bootstrap UCL	36615
Anderson-Darling Test Statistic	0.291	95% Bootstrap-t UCL	37395
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	38486
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	36587
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	36848
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	44460
		97.5% Chebyshev(Mean, Sd) UCL	49812
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	60324
95% Approximate Gamma UCL	38313		
95% Adjusted Gamma UCL	39378		
Potential UCL to Use		Use 95% Student's-t UCL	37188

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	209.9	Minimum of Log Data	5.346
Maximum	2668	Maximum of Log Data	7.889
Mean	934.1	Mean of log Data	6.561
Median	753	SD of log Data	0.771
SD	787.4		
Coefficient of Variation	0.843		
Skewness	1.615		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1342	95% H-UCL	1710
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1862
95% Adjusted-CLT UCL (Chen-1995)	1421	97.5% Chebyshev (MVUE) UCL	2268
95% Modified-t UCL (Johnson-1978)	1360	99% Chebyshev (MVUE) UCL	3066
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.513	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	617.4		
MLE of Mean	934.1		
MLE of Standard Deviation	759.4		
nu star	36.31		
Approximate Chi Square Value (.05)	23.52	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1308
Adjusted Chi Square Value	21.96	95% Jackknife UCL	1342
		95% Standard Bootstrap UCL	1300
Anderson-Darling Test Statistic	0.471	95% Bootstrap-t UCL	1963
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	3841
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	1322
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	1426
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1925
		97.5% Chebyshev(Mean, Sd) UCL	2354
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3196
95% Approximate Gamma UCL	1442		
95% Adjusted Gamma UCL	1545		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1442

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	0.267	Minimum of Log Data	-1.321
Maximum	10	Maximum of Log Data	2.303
Mean	9.189	Mean of log Data	2.001
Median	10	SD of log Data	1.046
SD	2.81		
Coefficient of Variation	0.306		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.65	95% H-UCL	32.89
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.93
95% Adjusted-CLT UCL (Chen-1995)	9.656	97.5% Chebyshev (MVUE) UCL	36.26
95% Modified-t UCL (Johnson-1978)	10.51	99% Chebyshev (MVUE) UCL	50.65

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.896	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.846		
MLE of Mean	9.189		
MLE of Standard Deviation	6.673		
nu star	45.51		
Approximate Chi Square Value (.05)	31.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.52
Adjusted Chi Square Value	29.22	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.223	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.553	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.72
		97.5% Chebyshev(Mean, Sd) UCL	14.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.26
95% Approximate Gamma UCL	13.48		
95% Adjusted Gamma UCL	14.31		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.72

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	1381	Maximum of Log Data	7.231
Mean	482.2	Mean of log Data	5.86
Median	380.8	SD of log Data	0.912
SD	377.5		
Coefficient of Variation	0.783		
Skewness	1.337		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.923
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	677.9	95% H-UCL	1134
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1127
95% Adjusted-CLT UCL (Chen-1995)	706.4	97.5% Chebyshev (MVUE) UCL	1395
95% Modified-t UCL (Johnson-1978)	684.9	99% Chebyshev (MVUE) UCL	1921
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.346	Data appear Normal at 5% Significance Level	
Theta Star	358.3		
MLE of Mean	482.2		
MLE of Standard Deviation	415.7		
nu star	32.3		
Approximate Chi Square Value (.05)	20.31	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	661.5
Adjusted Chi Square Value	18.87	95% Jackknife UCL	677.9
		95% Standard Bootstrap UCL	652.7
Anderson-Darling Test Statistic	0.301	95% Bootstrap-t UCL	762.6
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	811.9
Kolmogorov-Smirnov Test Statistic	0.154	95% Percentile Bootstrap UCL	665
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	696.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	957.2
		97.5% Chebyshev(Mean, Sd) UCL	1163
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1567
95% Approximate Gamma UCL	766.9		
95% Adjusted Gamma UCL	825.4		
Potential UCL to Use		Use 95% Student's-t UCL	677.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2
Raw Statistics		Log-transformed Statistics	
Minimum	0.39	Minimum of Log Data	-0.942
Maximum	5	Maximum of Log Data	1.609
Mean	4.616	Mean of log Data	1.397
Median	5	SD of log Data	0.736
SD	1.331		
Coefficient of Variation	0.288		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.306	95% H-UCL	9.173
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.16
95% Adjusted-CLT UCL (Chen-1995)	4.837	97.5% Chebyshev (MVUE) UCL	12.32
95% Modified-t UCL (Johnson-1978)	5.242	99% Chebyshev (MVUE) UCL	16.57
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.002	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.538		
MLE of Mean	4.616		
MLE of Standard Deviation	2.664		
nu star	72.05		
Approximate Chi Square Value (.05)	53.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.248
Adjusted Chi Square Value	51.07	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.161	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.545	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.29
		97.5% Chebyshev(Mean, Sd) UCL	7.015
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.438
95% Approximate Gamma UCL	6.216		
95% Adjusted Gamma UCL	6.512		

Potential UCL to Use — Use 95% Chebyshev (Mean, Sd) UCL 6.29
Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Thorium-230

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thorium-230 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	17.91	Minimum of Log Data	2.885
Maximum	524.2	Maximum of Log Data	6.262
Mean	200	Mean of log Data	4.725
Median	159.2	SD of log Data	1.256
SD	180.1		
Coefficient of Variation	0.901		
Skewness	0.558		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.885	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	293.3	95% H-UCL	897.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	608.5
95% Adjusted-CLT UCL (Chen-1995)	294.4	97.5% Chebyshev (MVUE) UCL	774.9
95% Modified-t UCL (Johnson-1978)	294.7	99% Chebyshev (MVUE) UCL	1102
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.81	Data appear Normal at 5% Significance Level	
Theta Star	246.9		
MLE of Mean	200		
MLE of Standard Deviation	222.2		
nu star	19.44		
Approximate Chi Square Value (.05)	10.44	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	285.5
Adjusted Chi Square Value	9.446	95% Jackknife UCL	293.3
		95% Standard Bootstrap UCL	282
Anderson-Darling Test Statistic	0.48	95% Bootstrap-t UCL	313
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	281.4
Kolmogorov-Smirnov Test Statistic	0.164	95% Percentile Bootstrap UCL	284.5
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	284.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	426.6
		97.5% Chebyshev(Mean, Sd) UCL	524.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	717.3
95% Approximate Gamma UCL	372.4		
95% Adjusted Gamma UCL	411.5		

Potential UCL to Use		Use 95% Student's-t UCL	293.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6
Raw Statistics		Log-transformed Statistics	
Minimum	7.2	Minimum of Log Data	1.974
Maximum	16.84	Maximum of Log Data	2.824
Mean	11.63	Mean of log Data	2.432
Median	11	SD of log Data	0.218
SD	2.583		
Coefficient of Variation	0.222		
Skewness	0.815		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.826	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	12.97	95% H-UCL	13.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.84
95% Adjusted-CLT UCL (Chen-1995)	13.04	97.5% Chebyshev (MVUE) UCL	16.23
95% Modified-t UCL (Johnson-1978)	13	99% Chebyshev (MVUE) UCL	18.96
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.673		
MLE of Mean	11.63		
MLE of Standard Deviation	2.798		
nu star	414.8		
Approximate Chi Square Value (.05)	368.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.86
Adjusted Chi Square Value	361.9	95% Jackknife UCL	12.97
		95% Standard Bootstrap UCL	12.74
Anderson-Darling Test Statistic	1.133	95% Bootstrap-t UCL	13.71
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	15.56
Kolmogorov-Smirnov Test Statistic	0.327	95% Percentile Bootstrap UCL	12.89
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	12.97
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.88
		97.5% Chebyshev(Mean, Sd) UCL	16.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.05
95% Approximate Gamma UCL	13.09		
95% Adjusted Gamma UCL	13.33		

Potential UCL to Use		
	Use 95% Student's-t UCL	12.97
	or 95% Modified-t UCL	13

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	25	Minimum of Log Data	3.219
Maximum	85	Maximum of Log Data	4.443
Mean	70.43	Mean of log Data	4.205
Median	77.57	SD of log Data	0.363
SD	19.12		
Coefficient of Variation	0.271		
Skewness	-1.393		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.791	Shapiro Wilk Test Statistic	0.711
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	80.34	95% H-UCL	89.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	104.2
95% Adjusted-CLT UCL (Chen-1995)	77.13	97.5% Chebyshev (MVUE) UCL	118.4
95% Modified-t UCL (Johnson-1978)	79.97	99% Chebyshev (MVUE) UCL	146.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.802	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.027		
MLE of Mean	70.43		
MLE of Standard Deviation	25.21		
nu star	187.2		
Approximate Chi Square Value (.05)	156.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	79.5
Adjusted Chi Square Value	152.3	95% Jackknife UCL	80.34
		95% Standard Bootstrap UCL	78.9
Anderson-Darling Test Statistic	1.21	95% Bootstrap-t UCL	78.4
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	77.62
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL	78.76
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	77.46
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.48
		97.5% Chebyshev(Mean, Sd) UCL	104.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	125.3
95% Approximate Gamma UCL	84.21		
95% Adjusted Gamma UCL	86.58		
Potential UCL to Use		Use 95% Student's-t UCL	80.34
		or 95% Modified-t UCL	79.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	7.9	Minimum of Log Data	2.067
Maximum	195.6	Maximum of Log Data	5.276
Mean	98.27	Mean of log Data	4.294
Median	92.48	SD of log Data	0.96
SD	59.79		
Coefficient of Variation	0.608		
Skewness	0.0983		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.95	Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	129.3	95% H-UCL	264.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	252.6
95% Adjusted-CLT UCL (Chen-1995)	127.2	97.5% Chebyshev (MVUE) UCL	314.1
95% Modified-t UCL (Johnson-1978)	129.3	99% Chebyshev (MVUE) UCL	434.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.447	Data appear Normal at 5% Significance Level	
Theta Star	67.93		
MLE of Mean	98.27		
MLE of Standard Deviation	81.7		
nu star	34.72		
Approximate Chi Square Value (.05)	22.24	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	126.7
Adjusted Chi Square Value	20.72	95% Jackknife UCL	129.3
		95% Standard Bootstrap UCL	125.7
Anderson-Darling Test Statistic	0.537	95% Bootstrap-t UCL	130.5
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	126.2
Kolmogorov-Smirnov Test Statistic	0.253	95% Percentile Bootstrap UCL	125.5
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	125.6
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	173.5
		97.5% Chebyshev(Mean, Sd) UCL	206
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	270
95% Approximate Gamma UCL	153.4		
95% Adjusted Gamma UCL	164.6		
Potential UCL to Use		Use 95% Student's-t UCL	129.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	18071	Minimum of Log Data	9.802
Maximum	54899	Maximum of Log Data	10.91
Mean	29527	Mean of log Data	10.25
Median	26323	SD of log Data	0.312
SD	10223		
Coefficient of Variation	0.346		
Skewness	1.483		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	34827	95% H-UCL	35483
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41121
95% Adjusted-CLT UCL (Chen-1995)	35732	97.5% Chebyshev (MVUE) UCL	46175
95% Modified-t UCL (Johnson-1978)	35038	99% Chebyshev (MVUE) UCL	56102
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.081	Data appear Normal at 5% Significance Level	
Theta Star	3654		
MLE of Mean	29527		
MLE of Standard Deviation	10387		
nu star	194		
Approximate Chi Square Value (.05)	162.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	34381
Adjusted Chi Square Value	158.4	95% Jackknife UCL	34827
		95% Standard Bootstrap UCL	34365
Anderson-Darling Test Statistic	0.39	95% Bootstrap-t UCL	37825
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	40850
Kolmogorov-Smirnov Test Statistic	0.219	95% Percentile Bootstrap UCL	34607
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	35304
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	42391
		97.5% Chebyshev(Mean, Sd) UCL	47957
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	58890
95% Approximate Gamma UCL	35192		
95% Adjusted Gamma UCL	36162		
Potential UCL to Use		Use 95% Student's-t UCL	34827

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	278.2	Minimum of Log Data	5.628
Maximum	1548	Maximum of Log Data	7.345
Mean	824.2	Mean of log Data	6.57
Median	706.4	SD of log Data	0.574
SD	449.6		
Coefficient of Variation	0.545		
Skewness	0.599		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.887	Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1057	95% H-UCL	1238
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1444
95% Adjusted-CLT UCL (Chen-1995)	1062	97.5% Chebyshev (MVUE) UCL	1711
95% Modified-t UCL (Johnson-1978)	1061	99% Chebyshev (MVUE) UCL	2234
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.772	Data appear Normal at 5% Significance Level	
Theta Star	297.3		
MLE of Mean	824.2		
MLE of Standard Deviation	495		
nu star	66.52		
Approximate Chi Square Value (.05)	48.75	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1038
Adjusted Chi Square Value	46.44	95% Jackknife UCL	1057
		95% Standard Bootstrap UCL	1030
Anderson-Darling Test Statistic	0.37	95% Bootstrap-t UCL	1097
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	1032
Kolmogorov-Smirnov Test Statistic	0.165	95% Percentile Bootstrap UCL	1038
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	1058
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1390
		97.5% Chebyshev(Mean, Sd) UCL	1635
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2116
95% Approximate Gamma UCL	1125		
95% Adjusted Gamma UCL	1181		
Potential UCL to Use		Use 95% Student's-t UCL	1057

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	7.48	Minimum of Log Data	2.012
Maximum	10	Maximum of Log Data	2.303
Mean	9.79	Mean of log Data	2.278
Median	10	SD of log Data	0.0838
SD	0.727		
Coefficient of Variation	0.0743		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.17	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.83
95% Adjusted-CLT UCL (Chen-1995)	9.911	97.5% Chebyshev (MVUE) UCL	11.27
95% Modified-t UCL (Johnson-1978)	10.13	99% Chebyshev (MVUE) UCL	12.15

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	126.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0775		
MLE of Mean	9.79		
MLE of Standard Deviation	0.871		
nu star	3032		
Approximate Chi Square Value (.05)	2905	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.14
Adjusted Chi Square Value	2886	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.085	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.535	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.71
		97.5% Chebyshev(Mean, Sd) UCL	11.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.88
95% Approximate Gamma UCL	10.22		
95% Adjusted Gamma UCL	10.28		

Potential UCL to Use		Use 95% Student's-t UCL	10.17
		or 95% Modified-t UCL	10.13

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Molybdenum

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	2.8	Minimum of Log Data	1.03
Maximum	28.67	Maximum of Log Data	3.356
Mean	15.12	Mean of log Data	2.622
Median	15	SD of log Data	0.535
SD	5.523		
Coefficient of Variation	0.365		
Skewness	0.398		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.515
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.99	95% H-UCL	22.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.51
95% Adjusted-CLT UCL (Chen-1995)	17.94	97.5% Chebyshev (MVUE) UCL	31.2
95% Modified-t UCL (Johnson-1978)	18.02	99% Chebyshev (MVUE) UCL	40.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.165	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.631		
MLE of Mean	15.12		
MLE of Standard Deviation	7.41		
nu star	99.96		
Approximate Chi Square Value (.05)	77.89	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	17.74
Adjusted Chi Square Value	74.93	95% Jackknife UCL	17.99
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.845	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.466	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.07
		97.5% Chebyshev(Mean, Sd) UCL	25.08
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30.99
95% Approximate Gamma UCL	19.41		
95% Adjusted Gamma UCL	20.18		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	22.07

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	18.2	Minimum of Log Data	2.901
Maximum	1198	Maximum of Log Data	7.089
Mean	389.9	Mean of log Data	5.458
Median	248.4	SD of log Data	1.204
SD	359.7		
Coefficient of Variation	0.923		
Skewness	1.175		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	576.4	95% H-UCL	1604
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1169
95% Adjusted-CLT UCL (Chen-1995)	598.3	97.5% Chebyshev (MVUE) UCL	1483
95% Modified-t UCL (Johnson-1978)	582.2	99% Chebyshev (MVUE) UCL	2101
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.898	Data appear Normal at 5% Significance Level	
Theta Star	434.3		
MLE of Mean	389.9		
MLE of Standard Deviation	411.5		
nu star	21.54		
Approximate Chi Square Value (.05)	12	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	560.7
Adjusted Chi Square Value	10.92	95% Jackknife UCL	576.4
		95% Standard Bootstrap UCL	551.2
Anderson-Darling Test Statistic	0.172	95% Bootstrap-t UCL	649.3
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	601.4
Kolmogorov-Smirnov Test Statistic	0.113	95% Percentile Bootstrap UCL	562.8
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	586.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	842.5
		97.5% Chebyshev(Mean, Sd) UCL	1038
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1423
95% Approximate Gamma UCL	700.1		
95% Adjusted Gamma UCL	768.9		
Potential UCL to Use		Use 95% Student's-t UCL	576.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.065	Minimum of Log Data	-2.733
Maximum	10	Maximum of Log Data	2.303
Mean	5.422	Mean of log Data	1.363
Median	5	SD of log Data	1.317
SD	2.562		
Coefficient of Variation	0.473		
Skewness	0.243		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.698	Shapiro Wilk Test Statistic	0.468
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.75	95% H-UCL	37.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	23.28
95% Adjusted-CLT UCL (Chen-1995)	6.694	97.5% Chebyshev (MVUE) UCL	29.77
95% Modified-t UCL (Johnson-1978)	6.759	99% Chebyshev (MVUE) UCL	42.51
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.311	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.135		
MLE of Mean	5.422		
MLE of Standard Deviation	4.735		
nu star	31.47		
Approximate Chi Square Value (.05)	19.65	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.639
Adjusted Chi Square Value	18.24	95% Jackknife UCL	6.75
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.583	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.48	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.646
		97.5% Chebyshev(Mean, Sd) UCL	10.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12.78
95% Approximate Gamma UCL	8.682		
95% Adjusted Gamma UCL	9.356		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	8.646

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	349.2	Maximum of Log Data	5.856
Mean	79.73	Mean of log Data	3.583
Median	29.32	SD of log Data	1.301
SD	109.6		
Coefficient of Variation	1.375		
Skewness	1.762		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.691	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	136.6	95% H-UCL	330.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	209
95% Adjusted-CLT UCL (Chen-1995)	149	97.5% Chebyshev (MVUE) UCL	267
95% Modified-t UCL (Johnson-1978)	139.2	99% Chebyshev (MVUE) UCL	380.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.62	Data appear Lognormal at 5% Significance Level	
Theta Star	128.7		
MLE of Mean	79.73		
MLE of Standard Deviation	101.3		
nu star	14.87		
Approximate Chi Square Value (.05)	7.174	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	131.8
Adjusted Chi Square Value	6.374	95% Jackknife UCL	136.6
		95% Standard Bootstrap UCL	130.1
Anderson-Darling Test Statistic	0.825	95% Bootstrap-t UCL	176.2
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	123.8
Kolmogorov-Smirnov Test Statistic	0.284	95% Percentile Bootstrap UCL	135.5
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	147.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	217.7
		97.5% Chebyshev(Mean, Sd) UCL	277.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	394.6
95% Approximate Gamma UCL	165.3		
95% Adjusted Gamma UCL	186		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	217.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	20.75	Maximum of Log Data	3.033
Mean	11.8	Mean of log Data	2.446
Median	11	SD of log Data	0.209
SD	2.989		
Coefficient of Variation	0.253		
Skewness	2.592		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.694
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	13.28	95% H-UCL	13.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.76
95% Adjusted-CLT UCL (Chen-1995)	13.8	97.5% Chebyshev (MVUE) UCL	16.05
95% Modified-t UCL (Johnson-1978)	13.38	99% Chebyshev (MVUE) UCL	18.59
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	17.04	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.693		
MLE of Mean	11.8		
MLE of Standard Deviation	2.859		
nu star	443.1		
Approximate Chi Square Value (.05)	395.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	13.17
Adjusted Chi Square Value	388.9	95% Jackknife UCL	13.28
		95% Standard Bootstrap UCL	13.11
Anderson-Darling Test Statistic	2.087	95% Bootstrap-t UCL	16.57
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	22.61
Kolmogorov-Smirnov Test Statistic	0.394	95% Percentile Bootstrap UCL	13.19
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	13.76
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.42
		97.5% Chebyshev(Mean, Sd) UCL	16.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.05
95% Approximate Gamma UCL	13.23		
95% Adjusted Gamma UCL	13.45		
Potential UCL to Use		Use 95% Student's-t UCL	13.28
		or 95% Modified-t UCL	13.38

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	36.37	Minimum of Log Data	3.594
Maximum	85	Maximum of Log Data	4.443
Mean	60.42	Mean of log Data	4.048
Median	54.54	SD of log Data	0.341
SD	20.18		
Coefficient of Variation	0.334		
Skewness	0.225		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.839	Shapiro Wilk Test Statistic	0.863
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	70.4	95% H-UCL	73.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.71
95% Adjusted-CLT UCL (Chen-1995)	70	97.5% Chebyshev (MVUE) UCL	96.64
95% Modified-t UCL (Johnson-1978)	70.46	99% Chebyshev (MVUE) UCL	118.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.43	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	8.132		
MLE of Mean	60.42		
MLE of Standard Deviation	22.17		
nu star	193.2		
Approximate Chi Square Value (.05)	162	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	69.63
Adjusted Chi Square Value	158	95% Jackknife UCL	70.4
		95% Standard Bootstrap UCL	69.35
Anderson-Darling Test Statistic	0.752	95% Bootstrap-t UCL	71.13
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	68.72
Kolmogorov-Smirnov Test Statistic	0.201	95% Percentile Bootstrap UCL	69.12
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	69.2
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	84.82
		97.5% Chebyshev(Mean, Sd) UCL	95.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	116.1
95% Approximate Gamma UCL	72.04		
95% Adjusted Gamma UCL	73.89		
Potential UCL to Use		Use 95% Approximate Gamma UCL	72.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	29.72	Minimum of Log Data	3.392
Maximum	1099	Maximum of Log Data	7.002
Mean	204.1	Mean of log Data	4.818
Median	115	SD of log Data	0.955
SD	282.2		
Coefficient of Variation	1.383		
Skewness	3.058		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.582	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	343.6	95% H-UCL	418.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	416.7
95% Adjusted-CLT UCL (Chen-1995)	403.8	97.5% Chebyshev (MVUE) UCL	516.4
95% Modified-t UCL (Johnson-1978)	354.7	99% Chebyshev (MVUE) UCL	712.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.925	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	220.6		
MLE of Mean	204.1		
MLE of Standard Deviation	212.2		
nu star	24.05		
Approximate Chi Square Value (.05)	13.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	332.8
Adjusted Chi Square Value	12.8	95% Jackknife UCL	343.6
		95% Standard Bootstrap UCL	326.1
Anderson-Darling Test Statistic	0.671	95% Bootstrap-t UCL	610
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	807.6
Kolmogorov-Smirnov Test Statistic	0.169	95% Percentile Bootstrap UCL	348.8
Kolmogorov-Smirnov 5% Critical Value	0.242	95% BCA Bootstrap UCL	421.5
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	545.3
		97.5% Chebyshev(Mean, Sd) UCL	692.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	982.9
95% Approximate Gamma UCL	353.5		
95% Adjusted Gamma UCL	383.6		
Potential UCL to Use		Use 95% Approximate Gamma UCL	353.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	14880	Minimum of Log Data	9.608
Maximum	62968	Maximum of Log Data	11.05
Mean	32078	Mean of log Data	10.29
Median	32463	SD of log Data	0.427
SD	13678		
Coefficient of Variation	0.426		
Skewness	0.919		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.926	Shapiro Wilk Test Statistic	0.962
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	38840	95% H-UCL	41561
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49017
95% Adjusted-CLT UCL (Chen-1995)	39352	97.5% Chebyshev (MVUE) UCL	56332
95% Modified-t UCL (Johnson-1978)	39001	99% Chebyshev (MVUE) UCL	70701
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.828	Data appear Normal at 5% Significance Level	
Theta Star	6644		
MLE of Mean	32078		
MLE of Standard Deviation	14599		
nu star	125.5		
Approximate Chi Square Value (.05)	100.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	38318
Adjusted Chi Square Value	97.48	95% Jackknife UCL	38840
		95% Standard Bootstrap UCL	38001
Anderson-Darling Test Statistic	0.246	95% Bootstrap-t UCL	40353
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	43351
Kolmogorov-Smirnov Test Statistic	0.144	95% Percentile Bootstrap UCL	38091
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	39229
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48614
		97.5% Chebyshev(Mean, Sd) UCL	55769
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	69824
95% Approximate Gamma UCL	40007		
95% Adjusted Gamma UCL	41308		
Potential UCL to Use		Use 95% Student's-t UCL	38840

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	0.487	Minimum of Log Data	-0.719
Maximum	10	Maximum of Log Data	2.303
Mean	9.268	Mean of log Data	2.07
Median	10	SD of log Data	0.838
SD	2.638		
Coefficient of Variation	0.285		
Skewness	-3.606		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.311	Shapiro Wilk Test Statistic	0.311
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.57	95% H-UCL	21.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22.59
95% Adjusted-CLT UCL (Chen-1995)	9.69	97.5% Chebyshev (MVUE) UCL	27.65
95% Modified-t UCL (Johnson-1978)	10.45	99% Chebyshev (MVUE) UCL	37.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.63	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.523		
MLE of Mean	9.268		
MLE of Standard Deviation	5.715		
nu star	68.39		
Approximate Chi Square Value (.05)	50.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.47
Adjusted Chi Square Value	48.16	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.585	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.55	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.46
		97.5% Chebyshev(Mean, Sd) UCL	13.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.55
95% Approximate Gamma UCL	12.59		
95% Adjusted Gamma UCL	13.16		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.46

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	151.2	Minimum of Log Data	5.018
Maximum	1591	Maximum of Log Data	7.372
Mean	504.9	Mean of log Data	5.998
Median	383	SD of log Data	0.675
SD	396.9		
Coefficient of Variation	0.786		
Skewness	1.918		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.795	Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	701.1	95% H-UCL	797.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	917.6
95% Adjusted-CLT UCL (Chen-1995)	748.6	97.5% Chebyshev (MVUE) UCL	1100
95% Modified-t UCL (Johnson-1978)	710.9	99% Chebyshev (MVUE) UCL	1459
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.868	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	270.3		
MLE of Mean	504.9		
MLE of Standard Deviation	369.5		
nu star	48.56		
Approximate Chi Square Value (.05)	33.57	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	686
Adjusted Chi Square Value	31.8	95% Jackknife UCL	701.1
		95% Standard Bootstrap UCL	678.2
Anderson-Darling Test Statistic	0.386	95% Bootstrap-t UCL	860.8
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	1332
Kolmogorov-Smirnov Test Statistic	0.162	95% Percentile Bootstrap UCL	690.1
Kolmogorov-Smirnov 5% Critical Value	0.239	95% BCA Bootstrap UCL	734.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	984.8
		97.5% Chebyshev(Mean, Sd) UCL	1192
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1600
95% Approximate Gamma UCL	730.5		
95% Adjusted Gamma UCL	771.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	730.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	2.6	Minimum of Log Data	0.956
Maximum	10	Maximum of Log Data	2.303
Mean	5.585	Mean of log Data	1.666
Median	5	SD of log Data	0.335
SD	2.068		
Coefficient of Variation	0.37		
Skewness	1.599		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.617	Shapiro Wilk Test Statistic	0.673
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.607	95% H-UCL	6.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.854
95% Adjusted-CLT UCL (Chen-1995)	6.8	97.5% Chebyshev (MVUE) UCL	8.843
95% Modified-t UCL (Johnson-1978)	6.649	99% Chebyshev (MVUE) UCL	10.78

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.268	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.768		
MLE of Mean	5.585		
MLE of Standard Deviation	2.072		
nu star	189		
Approximate Chi Square Value (.05)	158.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	6.528
Adjusted Chi Square Value	154.2	95% Jackknife UCL	6.607
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.53	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.434	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.085
		97.5% Chebyshev(Mean, Sd) UCL	9.166
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.29
95% Approximate Gamma UCL	6.672		
95% Adjusted Gamma UCL	6.846		

Potential UCL to Use			
		Use 95% Student's-t UCL	6.607
		or 95% Modified-t UCL	6.649

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.2	Minimum of Log Data	0.182
Maximum	11.7	Maximum of Log Data	2.46
Mean	9.454	Mean of log Data	2.152
Median	10	SD of log Data	0.593
SD	2.524		
Coefficient of Variation	0.267		
Skewness	-3.363		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.414	Shapiro Wilk Test Statistic	0.353
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.7	95% H-UCL	15.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.59
95% Adjusted-CLT UCL (Chen-1995)	9.908	97.5% Chebyshev (MVUE) UCL	20.84
95% Modified-t UCL (Johnson-1978)	10.59	99% Chebyshev (MVUE) UCL	27.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.23	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.235		
MLE of Mean	9.454		
MLE of Standard Deviation	4.597		
nu star	110		
Approximate Chi Square Value (.05)	86.77	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	10.61
Adjusted Chi Square Value	83.84	95% Jackknife UCL	10.7
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.078	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.531	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.51
		97.5% Chebyshev(Mean, Sd) UCL	13.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.42
95% Approximate Gamma UCL	11.98		
95% Adjusted Gamma UCL	12.4		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.51

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thorium-230 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	13	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	93	Minimum of Log Data	4.533
Maximum	663.2	Maximum of Log Data	6.497
Mean	270.1	Mean of log Data	5.428
Median	187.2	SD of log Data	0.597
SD	172.7		
Coefficient of Variation	0.64		
Skewness	1.22		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.861	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.866	Shapiro Wilk Critical Value	0.866
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	355.4	95% H-UCL	399.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	468.1
95% Adjusted-CLT UCL (Chen-1995)	366.2	97.5% Chebyshev (MVUE) UCL	554.8
95% Modified-t UCL (Johnson-1978)	358.1	99% Chebyshev (MVUE) UCL	724.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.43	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	111.1		
MLE of Mean	270.1		
MLE of Standard Deviation	173.2		
nu star	63.17		
Approximate Chi Square Value (.05)	45.89	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	348.9
Adjusted Chi Square Value	43.8	95% Jackknife UCL	355.4
		95% Standard Bootstrap UCL	347.2
Anderson-Darling Test Statistic	0.43	95% Bootstrap-t UCL	395.1
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	365.9
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	349.4
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	363.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	478.9
		97.5% Chebyshev(Mean, Sd) UCL	569.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	746.8
95% Approximate Gamma UCL	371.8		
95% Adjusted Gamma UCL	389.5		
Potential UCL to Use		Use 95% Approximate Gamma UCL	371.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	13	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	9.7	Minimum of Log Data	2.272
Maximum	16.35	Maximum of Log Data	2.794
Mean	11.97	Mean of log Data	2.47
Median	11	SD of log Data	0.163
SD	2.132		
Coefficient of Variation	0.178		
Skewness	1.551		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.735	Shapiro Wilk Test Statistic	0.774
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.08	95% H-UCL	13.09
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.42
95% Adjusted-CLT UCL (Chen-1995)	13.28	97.5% Chebyshev (MVUE) UCL	15.48
95% Modified-t UCL (Johnson-1978)	13.12	99% Chebyshev (MVUE) UCL	17.57
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	29.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.409		
MLE of Mean	11.97		
MLE of Standard Deviation	2.212		
nu star	703.1		
Approximate Chi Square Value (.05)	642.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	12.99
Adjusted Chi Square Value	633.7	95% Jackknife UCL	13.08
		95% Standard Bootstrap UCL	12.93
Anderson-Darling Test Statistic	1.451	95% Bootstrap-t UCL	14.44
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	18.85
Kolmogorov-Smirnov Test Statistic	0.347	95% Percentile Bootstrap UCL	13
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	13.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.66
		97.5% Chebyshev(Mean, Sd) UCL	15.82
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.1
95% Approximate Gamma UCL	13.1		
95% Adjusted Gamma UCL	13.28		
Potential UCL to Use		Use 95% Student's-t UCL	13.08
		or 95% Modified-t UCL	13.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cadmium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	35.55	Minimum of Log Data	3.571
Maximum	85	Maximum of Log Data	4.443
Mean	69.43	Mean of log Data	4.191
Median	85	SD of log Data	0.346
SD	20.75		
Coefficient of Variation	0.299		
Skewness	-0.74		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.721	Shapiro Wilk Test Statistic	0.729
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	80.19	95% H-UCL	86.12
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	100.5
95% Adjusted-CLT UCL (Chen-1995)	77.92	97.5% Chebyshev (MVUE) UCL	113.8
95% Modified-t UCL (Johnson-1978)	79.98	99% Chebyshev (MVUE) UCL	139.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.701	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.016		
MLE of Mean	69.43		
MLE of Standard Deviation	25.02		
nu star	184.8		
Approximate Chi Square Value (.05)	154.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	79.29
Adjusted Chi Square Value	150.1	95% Jackknife UCL	80.19
		95% Standard Bootstrap UCL	78.87
Anderson-Darling Test Statistic	1.651	95% Bootstrap-t UCL	79.36
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	77.49
Kolmogorov-Smirnov Test Statistic	0.363	95% Percentile Bootstrap UCL	78.28
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	77.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.55
		97.5% Chebyshev(Mean, Sd) UCL	106.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	129
95% Approximate Gamma UCL	83.13		
95% Adjusted Gamma UCL	85.48		
Potential UCL to Use		Use 95% Student's-t UCL	80.19
		or 95% Modified-t UCL	79.98

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cobalt was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	28.24	Minimum of Log Data	3.341
Maximum	218.2	Maximum of Log Data	5.385
Mean	93.8	Mean of log Data	4.356
Median	88.03	SD of log Data	0.644
SD	60.2		
Coefficient of Variation	0.642		
Skewness	1.154		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.858	Shapiro Wilk Test Statistic	0.945
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	125	95% H-UCL	150.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	173.1
95% Adjusted-CLT UCL (Chen-1995)	128.6	97.5% Chebyshev (MVUE) UCL	207.2
95% Modified-t UCL (Johnson-1978)	126	99% Chebyshev (MVUE) UCL	274.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.2	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	42.63		
MLE of Mean	93.8		
MLE of Standard Deviation	63.23		
nu star	52.81		
Approximate Chi Square Value (.05)	37.11	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	122.4
Adjusted Chi Square Value	35.11	95% Jackknife UCL	125
		95% Standard Bootstrap UCL	121.4
Anderson-Darling Test Statistic	0.373	95% Bootstrap-t UCL	140.8
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	263.2
Kolmogorov-Smirnov Test Statistic	0.174	95% Percentile Bootstrap UCL	122.7
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	128.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	169.5
		97.5% Chebyshev(Mean, Sd) UCL	202.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	266.7
95% Approximate Gamma UCL	133.5		
95% Adjusted Gamma UCL	141.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	133.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	8044	Minimum of Log Data	8.993
Maximum	66573	Maximum of Log Data	11.11
Mean	30422	Mean of log Data	10.17
Median	27396	SD of log Data	0.595
SD	16924		
Coefficient of Variation	0.556		
Skewness	0.933		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.933	Shapiro Wilk Test Statistic	0.976
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	39196	95% H-UCL	46945
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	54515
95% Adjusted-CLT UCL (Chen-1995)	39864	97.5% Chebyshev (MVUE) UCL	64802
95% Modified-t UCL (Johnson-1978)	39415	99% Chebyshev (MVUE) UCL	85009
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.672	Data appear Normal at 5% Significance Level	
Theta Star	11385		
MLE of Mean	30422		
MLE of Standard Deviation	18611		
nu star	64.13		
Approximate Chi Square Value (.05)	46.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	38458
Adjusted Chi Square Value	44.44	95% Jackknife UCL	39196
		95% Standard Bootstrap UCL	38312
Anderson-Darling Test Statistic	0.16	95% Bootstrap-t UCL	42182
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	45843
Kolmogorov-Smirnov Test Statistic	0.127	95% Percentile Bootstrap UCL	38763
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	39416
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	51717
		97.5% Chebyshev(Mean, Sd) UCL	60932
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	79032
95% Approximate Gamma UCL	41771		
95% Adjusted Gamma UCL	43897		
Potential UCL to Use		Use 95% Student's-t UCL	39196

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12

Raw Statistics		Log-transformed Statistics	
Minimum	105.1	Minimum of Log Data	4.655
Maximum	1545	Maximum of Log Data	7.343
Mean	633.3	Mean of log Data	6.278
Median	560.3	SD of log Data	0.664
SD	374.7		
Coefficient of Variation	0.592		
Skewness	1.328		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.893	Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	827.6	95% H-UCL	1066
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1214
95% Adjusted-CLT UCL (Chen-1995)	855.5	97.5% Chebyshev (MVUE) UCL	1458
95% Modified-t UCL (Johnson-1978)	834.5	99% Chebyshev (MVUE) UCL	1938

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.346	Data appear Normal at 5% Significance Level	
Theta Star	269.9		
MLE of Mean	633.3		
MLE of Standard Deviation	413.5		
nu star	56.31		
Approximate Chi Square Value (.05)	40.06	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	811.2
Adjusted Chi Square Value	37.98	95% Jackknife UCL	827.6
		95% Standard Bootstrap UCL	803.7
Anderson-Darling Test Statistic	0.345	95% Bootstrap-t UCL	907.2
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	1247
Kolmogorov-Smirnov Test Statistic	0.174	95% Percentile Bootstrap UCL	816.3
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	842.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1105
		97.5% Chebyshev(Mean, Sd) UCL	1309
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1709
95% Approximate Gamma UCL	890.2		
95% Adjusted Gamma UCL	939		

Potential UCL to Use		Use 95% Student's-t UCL	827.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.179	Minimum of Log Data	-1.72
Maximum	10.94	Maximum of Log Data	2.392
Mean	9.193	Mean of log Data	1.968
Median	10	SD of log Data	1.162
SD	2.863		
Coefficient of Variation	0.311		
Skewness	-3.357		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.421	Shapiro Wilk Test Statistic	0.35
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.68	95% H-UCL	43.39
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.4
95% Adjusted-CLT UCL (Chen-1995)	9.696	97.5% Chebyshev (MVUE) UCL	42.25
95% Modified-t UCL (Johnson-1978)	10.54	99% Chebyshev (MVUE) UCL	59.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.666	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.518		
MLE of Mean	9.193		
MLE of Standard Deviation	7.122		
nu star	39.98		
Approximate Chi Square Value (.05)	26.49	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.55
Adjusted Chi Square Value	24.83	95% Jackknife UCL	10.68
		95% Standard Bootstrap UCL	10.49
Anderson-Darling Test Statistic	3.915	95% Bootstrap-t UCL	10.25
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	9.994
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	10.16
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	10.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.8
		97.5% Chebyshev(Mean, Sd) UCL	14.35
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.42
95% Approximate Gamma UCL	13.87		
95% Adjusted Gamma UCL	14.8		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.8

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	697.1	Maximum of Log Data	6.547
Mean	361.5	Mean of log Data	5.724
Median	345.9	SD of log Data	0.666
SD	192.5		
Coefficient of Variation	0.533		
Skewness	0.466		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.945	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	461.3	95% H-UCL	614.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	699.4
95% Adjusted-CLT UCL (Chen-1995)	460.9	97.5% Chebyshev (MVUE) UCL	840.2
95% Modified-t UCL (Johnson-1978)	462.5	99% Chebyshev (MVUE) UCL	1117
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.423	Data appear Normal at 5% Significance Level	
Theta Star	149.2		
MLE of Mean	361.5		
MLE of Standard Deviation	232.2		
nu star	58.14		
Approximate Chi Square Value (.05)	41.61	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	452.9
Adjusted Chi Square Value	39.49	95% Jackknife UCL	461.3
		95% Standard Bootstrap UCL	449
Anderson-Darling Test Statistic	0.295	95% Bootstrap-t UCL	479.9
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	501.1
Kolmogorov-Smirnov Test Statistic	0.149	95% Percentile Bootstrap UCL	449.7
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	458.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	603.7
		97.5% Chebyshev(Mean, Sd) UCL	708.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	914.5
95% Approximate Gamma UCL	505.1		
95% Adjusted Gamma UCL	532.3		
Potential UCL to Use		Use 95% Student's-t UCL	461.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	1	Minimum of Log Data	0
Maximum	5	Maximum of Log Data	1.609
Mean	4.636	Mean of log Data	1.469
Median	5	SD of log Data	0.463
SD	1.15		
Coefficient of Variation	0.248		
Skewness	-3.415		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.367	Shapiro Wilk Test Statistic	0.348
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.233	95% H-UCL	6.482
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.64
95% Adjusted-CLT UCL (Chen-1995)	4.833	97.5% Chebyshev (MVUE) UCL	8.872
95% Modified-t UCL (Johnson-1978)	5.178	99% Chebyshev (MVUE) UCL	11.29
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.955	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.779		
MLE of Mean	4.636		
MLE of Standard Deviation	1.9		
nu star	142.9		
Approximate Chi Square Value (.05)	116.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.182
Adjusted Chi Square Value	112.6	95% Jackknife UCL	5.233
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.854	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.083
		97.5% Chebyshev(Mean, Sd) UCL	6.709
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.939
95% Approximate Gamma UCL	5.698		
95% Adjusted Gamma UCL	5.883		
Potential UCL to Use		Use 95% Student's-t UCL	5.233
		or 95% Modified-t UCL	5.178

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	1.2	Minimum of Log Data	0.182
Maximum	12.87	Maximum of Log Data	2.555
Mean	9.433	Mean of log Data	2.139
Median	10	SD of log Data	0.621
SD	2.734		
Coefficient of Variation	0.29		
Skewness	-2.753		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.538	Shapiro Wilk Test Statistic	0.414
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.85	95% H-UCL	15.85
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.29
95% Adjusted-CLT UCL (Chen-1995)	10.06	97.5% Chebyshev (MVUE) UCL	21.83
95% Modified-t UCL (Johnson-1978)	10.75	99% Chebyshev (MVUE) UCL	28.78
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.756	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.511		
MLE of Mean	9.433		
MLE of Standard Deviation	4.867		
nu star	90.14		
Approximate Chi Square Value (.05)	69.25	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.73
Adjusted Chi Square Value	66.46	95% Jackknife UCL	10.85
		95% Standard Bootstrap UCL	10.65
Anderson-Darling Test Statistic	3.253	95% Bootstrap-t UCL	10.39
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	10.24
Kolmogorov-Smirnov Test Statistic	0.477	95% Percentile Bootstrap UCL	10.45
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	10.24
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.87
		97.5% Chebyshev(Mean, Sd) UCL	14.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.29
95% Approximate Gamma UCL	12.28		
95% Adjusted Gamma UCL	12.79		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.87
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Technetium-99 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Thallium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thallium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Thorium-230

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Thorium-230 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		**Log-transformed Statistics**	
Minimum	20	Minimum of Log Data	2.996
Maximum	445	Maximum of Log Data	6.098
Mean	193.1	Mean of log Data	4.987
Median	159.9	SD of log Data	0.865
SD	133.3		
Coefficient of Variation	0.69		
Skewness	0.746		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	262.2	95% H-UCL	428
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	440.2
95% Adjusted-CLT UCL (Chen-1995)	265.2	97.5% Chebyshev (MVUE) UCL	542.1
95% Modified-t UCL (Johnson-1978)	263.6	99% Chebyshev (MVUE) UCL	742.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.528	Data appear Normal at 5% Significance Level	
Theta Star	126.3		
MLE of Mean	193.1		
MLE of Standard Deviation	156.2		
nu star	36.68		
Approximate Chi Square Value (.05)	23.82	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	256.4
Adjusted Chi Square Value	22.25	95% Jackknife UCL	262.2
		95% Standard Bootstrap UCL	252.7
Anderson-Darling Test Statistic	0.147	95% Bootstrap-t UCL	276.5
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	267.8
Kolmogorov-Smirnov Test Statistic	0.086	95% Percentile Bootstrap UCL	255.4
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	261.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	360.8
		97.5% Chebyshev(Mean, Sd) UCL	433.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	575.9
95% Approximate Gamma UCL	297.4		
95% Adjusted Gamma UCL	318.4		
Potential UCL to Use		Use 95% Student's-t UCL	262.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-06.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cadmium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	32.91	Minimum of Log Data	3.494
Maximum	897.6	Maximum of Log Data	6.8
Mean	148.4	Mean of log Data	4.56
Median	85	SD of log Data	0.756
SD	236.4		
Coefficient of Variation	1.593		
Skewness	3.438		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.365	Shapiro Wilk Test Statistic	0.521
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	270.9	95% H-UCL	225
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	246.8
95% Adjusted-CLT UCL (Chen-1995)	333	97.5% Chebyshev (MVUE) UCL	300.1
95% Modified-t UCL (Johnson-1978)	282.2	99% Chebyshev (MVUE) UCL	404.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.014	Data do not follow a Discernable Distribution (0.05)	
Theta Star	146.3		
MLE of Mean	148.4		
MLE of Standard Deviation	147.3		
nu star	24.34		
Approximate Chi Square Value (.05)	14.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	260.6
Adjusted Chi Square Value	12.93	95% Jackknife UCL	270.9
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.372	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	445.9
		97.5% Chebyshev(Mean, Sd) UCL	574.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	827.4
95% Approximate Gamma UCL	256		
95% Adjusted Gamma UCL	279.3		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	445.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	21.45	Minimum of Log Data	3.066
Maximum	207.4	Maximum of Log Data	5.334
Mean	92.47	Mean of log Data	4.341
Median	78.97	SD of log Data	0.659
SD	57.52		
Coefficient of Variation	0.622		
Skewness	0.932		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.972
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	122.3	95% H-UCL	152.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	173.9
95% Adjusted-CLT UCL (Chen-1995)	124.6	97.5% Chebyshev (MVUE) UCL	208.7
95% Modified-t UCL (Johnson-1978)	123	99% Chebyshev (MVUE) UCL	277
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.194	Data appear Normal at 5% Significance Level	
Theta Star	42.15		
MLE of Mean	92.47		
MLE of Standard Deviation	62.43		
nu star	52.64		
Approximate Chi Square Value (.05)	36.98	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	119.8
Adjusted Chi Square Value	34.98	95% Jackknife UCL	122.3
		95% Standard Bootstrap UCL	118.8
Anderson-Darling Test Statistic	0.218	95% Bootstrap-t UCL	130.3
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	129
Kolmogorov-Smirnov Test Statistic	0.13	95% Percentile Bootstrap UCL	120.3
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	122
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	164.8
		97.5% Chebyshev(Mean, Sd) UCL	196.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	257.7
95% Approximate Gamma UCL	131.6		
95% Adjusted Gamma UCL	139.2		
Potential UCL to Use		Use 95% Student's-t UCL	122.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	0.347	Minimum of Log Data	-1.058
Maximum	10	Maximum of Log Data	2.303
Mean	9.196	Mean of log Data	2.023
Median	10	SD of log Data	0.97
SD	2.787		
Coefficient of Variation	0.303		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.64	95% H-UCL	27.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	26.43
95% Adjusted-CLT UCL (Chen-1995)	9.659	97.5% Chebyshev (MVUE) UCL	32.9
95% Modified-t UCL (Johnson-1978)	10.51	99% Chebyshev (MVUE) UCL	45.61

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.083	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.415		
MLE of Mean	9.196		
MLE of Standard Deviation	6.371		
nu star	49.99		
Approximate Chi Square Value (.05)	34.76	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.52
Adjusted Chi Square Value	32.83	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.207	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.551	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.7
		97.5% Chebyshev(Mean, Sd) UCL	14.22
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.2
95% Approximate Gamma UCL	13.23		
95% Adjusted Gamma UCL	14		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.7
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	175.8	Minimum of Log Data	5.17
Maximum	1623	Maximum of Log Data	7.392
Mean	730.6	Mean of log Data	6.393
Median	653.8	SD of log Data	0.696
SD	448.9		
Coefficient of Variation	0.614		
Skewness	0.582		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.937	Shapiro Wilk Test Statistic	0.952
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	963.3	95% H-UCL	1261
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1421
95% Adjusted-CLT UCL (Chen-1995)	967	97.5% Chebyshev (MVUE) UCL	1714
95% Modified-t UCL (Johnson-1978)	967	99% Chebyshev (MVUE) UCL	2290
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.04	Data appear Normal at 5% Significance Level	
Theta Star	358.1		
MLE of Mean	730.6		
MLE of Standard Deviation	511.5		
nu star	48.97		
Approximate Chi Square Value (.05)	33.9	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	943.8
Adjusted Chi Square Value	32	95% Jackknife UCL	963.3
		95% Standard Bootstrap UCL	931.8
Anderson-Darling Test Statistic	0.273	95% Bootstrap-t UCL	985.7
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	986.5
Kolmogorov-Smirnov Test Statistic	0.141	95% Percentile Bootstrap UCL	928
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	959.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1295
		97.5% Chebyshev(Mean, Sd) UCL	1540
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2020
95% Approximate Gamma UCL	1055		
95% Adjusted Gamma UCL	1118		
Potential UCL to Use		Use 95% Student's-t UCL	963.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	0.67	Minimum of Log Data	-0.4
Maximum	5	Maximum of Log Data	1.609
Mean	4.639	Mean of log Data	1.442
Median	5	SD of log Data	0.58
SD	1.25		
Coefficient of Variation	0.269		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	5.287	95% H-UCL	7.41
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.632
95% Adjusted-CLT UCL (Chen-1995)	4.847	97.5% Chebyshev (MVUE) UCL	10.24
95% Modified-t UCL (Johnson-1978)	5.227	99% Chebyshev (MVUE) UCL	13.39

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.227	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.098		
MLE of Mean	4.639		
MLE of Standard Deviation	2.257		
nu star	101.4		
Approximate Chi Square Value (.05)	79.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	5.233
Adjusted Chi Square Value	76.21	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.134	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.542	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.212
		97.5% Chebyshev(Mean, Sd) UCL	6.893
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.229
95% Approximate Gamma UCL	5.942		
95% Adjusted Gamma UCL	6.175		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.212
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	16.63	Maximum of Log Data	2.811
Mean	10.82	Mean of log Data	2.368
Median	10	SD of log Data	0.161
SD	2.047		
Coefficient of Variation	0.189		
Skewness	2.596		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.477	Shapiro Wilk Test Statistic	0.484
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.88	95% H-UCL	11.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.99
95% Adjusted-CLT UCL (Chen-1995)	12.26	97.5% Chebyshev (MVUE) UCL	13.94
95% Modified-t UCL (Johnson-1978)	11.95	99% Chebyshev (MVUE) UCL	15.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	28.59	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.378		
MLE of Mean	10.82		
MLE of Standard Deviation	2.023		
nu star	686.2		
Approximate Chi Square Value (.05)	626.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.79
Adjusted Chi Square Value	617.7	95% Jackknife UCL	11.88
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.162	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.498	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	13.39
		97.5% Chebyshev(Mean, Sd) UCL	14.51
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.7
95% Approximate Gamma UCL	11.85		
95% Adjusted Gamma UCL	12.02		

Potential UCL to Use		
	Use 95% Student's-t UCL	11.88
	or 95% Modified-t UCL	11.95

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	146.4	Minimum of Log Data	4.986
Maximum	864.7	Maximum of Log Data	6.762
Mean	407.7	Mean of log Data	5.828
Median	320	SD of log Data	0.63
SD	260.2		
Coefficient of Variation	0.638		
Skewness	0.895		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	542.6	95% H-UCL	642.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	740.1
95% Adjusted-CLT UCL (Chen-1995)	552	97.5% Chebyshev (MVUE) UCL	884.5
95% Modified-t UCL (Johnson-1978)	545.8	99% Chebyshev (MVUE) UCL	1168
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.228	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	183		
MLE of Mean	407.7		
MLE of Standard Deviation	273.1		
nu star	53.47		
Approximate Chi Square Value (.05)	37.67	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	531.3
Adjusted Chi Square Value	35.66	95% Jackknife UCL	542.6
		95% Standard Bootstrap UCL	525.7
Anderson-Darling Test Statistic	0.408	95% Bootstrap-t UCL	589.8
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	545.8
Kolmogorov-Smirnov Test Statistic	0.136	95% Percentile Bootstrap UCL	523.6
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	550.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	735.1
		97.5% Chebyshev(Mean, Sd) UCL	876.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1155
95% Approximate Gamma UCL	578.7		
95% Adjusted Gamma UCL	611.4		
Potential UCL to Use		Use 95% Approximate Gamma UCL	578.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-07.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.28	Minimum of Log Data	2.228
Maximum	12.99	Maximum of Log Data	2.564
Mean	10.83	Mean of log Data	2.379
Median	11	SD of log Data	0.0847
SD	0.926		
Coefficient of Variation	0.0855		
Skewness	0.582		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.786	Shapiro Wilk Test Statistic	0.797
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.3	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.98
95% Adjusted-CLT UCL (Chen-1995)	11.31	97.5% Chebyshev (MVUE) UCL	12.48
95% Modified-t UCL (Johnson-1978)	11.31	99% Chebyshev (MVUE) UCL	13.46
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	113.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0952		
MLE of Mean	10.83		
MLE of Standard Deviation	1.015		
nu star	2730		
Approximate Chi Square Value (.05)	2609	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	11.26
Adjusted Chi Square Value	2591	95% Jackknife UCL	11.3
		95% Standard Bootstrap UCL	11.24
Anderson-Darling Test Statistic	1.427	95% Bootstrap-t UCL	11.33
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.49
Kolmogorov-Smirnov Test Statistic	0.339	95% Percentile Bootstrap UCL	11.25
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.27
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.99
		97.5% Chebyshev(Mean, Sd) UCL	12.49
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.48
95% Approximate Gamma UCL	11.32		
95% Adjusted Gamma UCL	11.4		
Potential UCL to Use		Use 95% Student's-t UCL	11.3
		or 95% Modified-t UCL	11.31

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cadmium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	18.1	Minimum of Log Data	2.896
Maximum	85	Maximum of Log Data	4.443
Mean	60.56	Mean of log Data	3.979
Median	74.78	SD of log Data	0.558
SD	27.58		
Coefficient of Variation	0.455		
Skewness	-0.372		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.773	Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	74.86	95% H-UCL	90.73
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.1
95% Adjusted-CLT UCL (Chen-1995)	72.75	97.5% Chebyshev (MVUE) UCL	125.4
95% Modified-t UCL (Johnson-1978)	74.72	99% Chebyshev (MVUE) UCL	163.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.184	Data do not follow a Discernable Distribution (0.05)	
Theta Star	19.02		
MLE of Mean	60.56		
MLE of Standard Deviation	33.94		
nu star	76.41		
Approximate Chi Square Value (.05)	57.28	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	73.66
Adjusted Chi Square Value	54.76	95% Jackknife UCL	74.86
		95% Standard Bootstrap UCL	72.55
Anderson-Darling Test Statistic	1.22	95% Bootstrap-t UCL	74.64
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	71.16
Kolmogorov-Smirnov Test Statistic	0.314	95% Percentile Bootstrap UCL	73.71
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	72.36
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	95.27
		97.5% Chebyshev(Mean, Sd) UCL	110.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	139.8
95% Approximate Gamma UCL	80.8		
95% Adjusted Gamma UCL	84.52		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	95.27
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.422	Minimum of Log Data	-0.863
Maximum	10	Maximum of Log Data	2.303
Mean	9.02	Mean of log Data	2.018
Median	10	SD of log Data	0.91
SD	2.779		
Coefficient of Variation	0.308		
Skewness	-3.191		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.362
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.46	95% H-UCL	24.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.12
95% Adjusted-CLT UCL (Chen-1995)	9.55	97.5% Chebyshev (MVUE) UCL	29.85
95% Modified-t UCL (Johnson-1978)	10.34	99% Chebyshev (MVUE) UCL	41.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.243	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.022		
MLE of Mean	9.02		
MLE of Standard Deviation	6.023		
nu star	53.82		
Approximate Chi Square Value (.05)	37.97	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.34
Adjusted Chi Square Value	35.94	95% Jackknife UCL	10.46
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.725	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.52
		97.5% Chebyshev(Mean, Sd) UCL	14.03
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17
95% Approximate Gamma UCL	12.79		
95% Adjusted Gamma UCL	13.51		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 95% Chebyshev (Mean, Sd) UCL	12.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	84.54	Minimum of Log Data	4.437
Maximum	2668	Maximum of Log Data	7.889
Mean	670.3	Mean of log Data	5.972
Median	325.6	SD of log Data	1.055
SD	799.7		
Coefficient of Variation	1.193		
Skewness	1.919		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.723	Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1085	95% H-UCL	1785
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1556
95% Adjusted-CLT UCL (Chen-1995)	1187	97.5% Chebyshev (MVUE) UCL	1951
95% Modified-t UCL (Johnson-1978)	1106	99% Chebyshev (MVUE) UCL	2728
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.858	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	781.7		
MLE of Mean	670.3		
MLE of Standard Deviation	723.9		
nu star	20.58		
Approximate Chi Square Value (.05)	11.28	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1050
Adjusted Chi Square Value	10.24	95% Jackknife UCL	1085
		95% Standard Bootstrap UCL	1038
Anderson-Darling Test Statistic	0.501	95% Bootstrap-t UCL	1770
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	2990
Kolmogorov-Smirnov Test Statistic	0.179	95% Percentile Bootstrap UCL	1058
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	1171
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1677
		97.5% Chebyshev(Mean, Sd) UCL	2112
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2967
95% Approximate Gamma UCL	1223		
95% Adjusted Gamma UCL	1347		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1223

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.44	Minimum of Log Data	-0.821
Maximum	10	Maximum of Log Data	2.303
Mean	5.037	Mean of log Data	1.465
Median	5	SD of log Data	0.747
SD	2.04		
Coefficient of Variation	0.405		
Skewness	0.323		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.598	Shapiro Wilk Test Statistic	0.477
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.094	95% H-UCL	10.01
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.03
95% Adjusted-CLT UCL (Chen-1995)	6.064	97.5% Chebyshev (MVUE) UCL	13.39
95% Modified-t UCL (Johnson-1978)	6.103	99% Chebyshev (MVUE) UCL	18.04
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.64	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.908		
MLE of Mean	5.037		
MLE of Standard Deviation	3.1		
nu star	63.35		
Approximate Chi Square Value (.05)	46.04	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.005
Adjusted Chi Square Value	43.8	95% Jackknife UCL	6.094
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.955	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.483	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.604
		97.5% Chebyshev(Mean, Sd) UCL	8.714
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.9
95% Approximate Gamma UCL	6.93		
95% Adjusted Gamma UCL	7.285		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	7.604

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	48.47	Minimum of Log Data	3.881
Maximum	762.9	Maximum of Log Data	6.637
Mean	184.2	Mean of log Data	4.865
Median	105.7	SD of log Data	0.802
SD	200.8		
Coefficient of Variation	1.09		
Skewness	2.529		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.663	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	288.3	95% H-UCL	332.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	356.4
95% Adjusted-CLT UCL (Chen-1995)	324.7	97.5% Chebyshev (MVUE) UCL	435.7
95% Modified-t UCL (Johnson-1978)	295.3	99% Chebyshev (MVUE) UCL	591.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.233	Data appear Lognormal at 5% Significance Level	
Theta Star	149.4		
MLE of Mean	184.2		
MLE of Standard Deviation	165.9		
nu star	29.58		
Approximate Chi Square Value (.05)	18.17	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	279.5
Adjusted Chi Square Value	16.81	95% Jackknife UCL	288.3
		95% Standard Bootstrap UCL	272.1
Anderson-Darling Test Statistic	0.783	95% Bootstrap-t UCL	434.2
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	625.8
Kolmogorov-Smirnov Test Statistic	0.291	95% Percentile Bootstrap UCL	282.9
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	329
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	436.8
		97.5% Chebyshev(Mean, Sd) UCL	546.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	760.8
95% Approximate Gamma UCL	300		
95% Adjusted Gamma UCL	324.1		
Potential UCL to Use		Use 95% H-UCL	332.9

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-08.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	8.05	Minimum of Log Data	2.086
Maximum	14.02	Maximum of Log Data	2.64
Mean	10.63	Mean of log Data	2.355
Median	11	SD of log Data	0.137
SD	1.46		
Coefficient of Variation	0.137		
Skewness	0.574		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.843	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.38	95% H-UCL	11.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.46
95% Adjusted-CLT UCL (Chen-1995)	11.39	97.5% Chebyshev (MVUE) UCL	13.25
95% Modified-t UCL (Johnson-1978)	11.4	99% Chebyshev (MVUE) UCL	14.81
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	44.01	Data appear Lognormal at 5% Significance Level	
Theta Star	0.241		
MLE of Mean	10.63		
MLE of Standard Deviation	1.602		
nu star	1056		
Approximate Chi Square Value (.05)	981.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	11.32
Adjusted Chi Square Value	970.8	95% Jackknife UCL	11.38
		95% Standard Bootstrap UCL	11.29
Anderson-Darling Test Statistic	1.002	95% Bootstrap-t UCL	11.43
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	11.69
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	11.34
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.34
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.46
		97.5% Chebyshev(Mean, Sd) UCL	13.26
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.82
95% Approximate Gamma UCL	11.43		
95% Adjusted Gamma UCL	11.56		
Potential UCL to Use		Use 95% Student's-t UCL	11.38
		or 95% Modified-t UCL	11.4
		or 95% H-UCL	11.45

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	32.42	Minimum of Log Data	3.479
Maximum	85	Maximum of Log Data	4.443
Mean	69.46	Mean of log Data	4.175
Median	85	SD of log Data	0.403
SD	23.15		
Coefficient of Variation	0.333		
Skewness	-0.87		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.652	Shapiro Wilk Test Statistic	0.668
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	81.46	95% H-UCL	90.23
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.1
95% Adjusted-CLT UCL (Chen-1995)	78.66	97.5% Chebyshev (MVUE) UCL	121.7
95% Modified-t UCL (Johnson-1978)	81.18	99% Chebyshev (MVUE) UCL	152.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.874	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.82		
MLE of Mean	69.46		
MLE of Standard Deviation	28.66		
nu star	141		
Approximate Chi Square Value (.05)	114.5	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	80.45
Adjusted Chi Square Value	110.9	95% Jackknife UCL	81.46
		95% Standard Bootstrap UCL	79.7
Anderson-Darling Test Statistic	2.127	95% Bootstrap-t UCL	80.45
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	78.61
Kolmogorov-Smirnov Test Statistic	0.425	95% Percentile Bootstrap UCL	78.51
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	77.72
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.59
		97.5% Chebyshev(Mean, Sd) UCL	111.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	135.9
95% Approximate Gamma UCL	85.49		
95% Adjusted Gamma UCL	88.29		
Potential UCL to Use		Use 95% Student's-t UCL	81.46
		or 95% Modified-t UCL	81.18

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	10	Maximum of Log Data	2.303
Mean	8.996	Mean of log Data	1.84
Median	10	SD of log Data	1.531
SD	2.881		
Coefficient of Variation	0.32		
Skewness	-3.225		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.414	Shapiro Wilk Test Statistic	0.347
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.49	95% H-UCL	126.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	53.2
95% Adjusted-CLT UCL (Chen-1995)	9.536	97.5% Chebyshev (MVUE) UCL	68.82
95% Modified-t UCL (Johnson-1978)	10.36	99% Chebyshev (MVUE) UCL	99.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.215	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.406		
MLE of Mean	8.996		
MLE of Standard Deviation	8.162		
nu star	29.15		
Approximate Chi Square Value (.05)	17.83	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.36
Adjusted Chi Square Value	16.49	95% Jackknife UCL	10.49
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.99	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.49	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.62
		97.5% Chebyshev(Mean, Sd) UCL	14.19
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.27
95% Approximate Gamma UCL	14.71		
95% Adjusted Gamma UCL	15.91		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.27

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	112.5	Minimum of Log Data	4.723
Maximum	1300	Maximum of Log Data	7.17
Mean	502.6	Mean of log Data	6.033
Median	429.5	SD of log Data	0.656
SD	327.6		
Coefficient of Variation	0.652		
Skewness	1.427		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.988
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	672.5	95% H-UCL	822
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	939.3
95% Adjusted-CLT UCL (Chen-1995)	699.8	97.5% Chebyshev (MVUE) UCL	1127
95% Modified-t UCL (Johnson-1978)	679	99% Chebyshev (MVUE) UCL	1495
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.177	Data appear Normal at 5% Significance Level	
Theta Star	230.9		
MLE of Mean	502.6		
MLE of Standard Deviation	340.7		
nu star	52.24		
Approximate Chi Square Value (.05)	36.64	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	658.2
Adjusted Chi Square Value	34.65	95% Jackknife UCL	672.5
		95% Standard Bootstrap UCL	651.9
Anderson-Darling Test Statistic	0.169	95% Bootstrap-t UCL	783.1
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	1478
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	655.2
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	696.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	914.9
		97.5% Chebyshev(Mean, Sd) UCL	1093
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1444
95% Approximate Gamma UCL	716.7		
95% Adjusted Gamma UCL	757.7		
Potential UCL to Use		Use 95% Student's-t UCL	672.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	2
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	5	Maximum of Log Data	1.609
Mean	4.593	Mean of log Data	1.291
Median	5	SD of log Data	1.102
SD	1.412		
Coefficient of Variation	0.307		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	5.324	95% H-UCL	18.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.48
95% Adjusted-CLT UCL (Chen-1995)	4.827	97.5% Chebyshev (MVUE) UCL	19.5
95% Modified-t UCL (Johnson-1978)	5.256	99% Chebyshev (MVUE) UCL	27.38
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.779	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.581		
MLE of Mean	4.593		
MLE of Standard Deviation	3.443		
nu star	42.7		
Approximate Chi Square Value (.05)	28.72	**Nonparametric Statistics**	
Adjusted Level of Significance	0.029	95% CLT UCL	5.263
Adjusted Chi Square Value	26.98	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.235	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.554	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.369
		97.5% Chebyshev(Mean, Sd) UCL	7.137
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.647
95% Approximate Gamma UCL	6.828		
95% Adjusted Gamma UCL	7.269		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.369
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.062	Minimum of Log Data	-2.781
Maximum	10	Maximum of Log Data	2.303
Mean	9.141	Mean of log Data	1.876
Median	10	SD of log Data	1.466
SD	2.861		
Coefficient of Variation	0.313		
Skewness	-3.456		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.344	Shapiro Wilk Test Statistic	0.33
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.62	95% H-UCL	103.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.54
95% Adjusted-CLT UCL (Chen-1995)	9.619	97.5% Chebyshev (MVUE) UCL	63.87
95% Modified-t UCL (Johnson-1978)	10.49	99% Chebyshev (MVUE) UCL	92.04

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.279	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.149		
MLE of Mean	9.141		
MLE of Standard Deviation	8.084		
nu star	30.69		
Approximate Chi Square Value (.05)	19.03	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.5
Adjusted Chi Square Value	17.64	95% Jackknife UCL	10.62
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.257	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.546	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.74
		97.5% Chebyshev(Mean, Sd) UCL	14.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.36
95% Approximate Gamma UCL	14.74		
95% Adjusted Gamma UCL	15.9		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.74
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	8.8	Minimum of Log Data	2.175
Maximum	638.1	Maximum of Log Data	6.459
Mean	166	Mean of log Data	4.375
Median	59.43	SD of log Data	1.333
SD	200		
Coefficient of Variation	1.204		
Skewness	1.497		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.775	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	269.7	95% H-UCL	806
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	485.4
95% Adjusted-CLT UCL (Chen-1995)	287.6	97.5% Chebyshev (MVUE) UCL	621.1
95% Modified-t UCL (Johnson-1978)	273.9	99% Chebyshev (MVUE) UCL	887.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.659	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	252		
MLE of Mean	166		
MLE of Standard Deviation	204.5		
nu star	15.82		
Approximate Chi Square Value (.05)	7.832	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	261
Adjusted Chi Square Value	6.991	95% Jackknife UCL	269.7
		95% Standard Bootstrap UCL	257.1
Anderson-Darling Test Statistic	0.48	95% Bootstrap-t UCL	334.9
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	270.1
Kolmogorov-Smirnov Test Statistic	0.212	95% Percentile Bootstrap UCL	266.7
Kolmogorov-Smirnov 5% Critical Value	0.254	95% BCA Bootstrap UCL	281.3
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	417.7
		97.5% Chebyshev(Mean, Sd) UCL	526.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	740.5
95% Approximate Gamma UCL	335.3		
95% Adjusted Gamma UCL	375.6		
Potential UCL to Use		Use 95% Approximate Gamma UCL	335.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-09.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	5.85	Minimum of Log Data	1.766
Maximum	23.57	Maximum of Log Data	3.16
Mean	11.49	Mean of log Data	2.38
Median	11	SD of log Data	0.356
SD	4.569		
Coefficient of Variation	0.398		
Skewness	1.741		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.828	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	13.86	95% H-UCL	14.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	16.65
95% Adjusted-CLT UCL (Chen-1995)	14.37	97.5% Chebyshev (MVUE) UCL	18.89
95% Modified-t UCL (Johnson-1978)	13.97	99% Chebyshev (MVUE) UCL	23.31

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.295	ata Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	1.826		
MLE of Mean	11.49		
MLE of Standard Deviation	4.581		
nu star	151.1		
Approximate Chi Square Value (.05)	123.7	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	13.66
Adjusted Chi Square Value	119.9	95% Jackknife UCL	13.86
		95% Standard Bootstrap UCL	13.55
Anderson-Darling Test Statistic	0.546	95% Bootstrap-t UCL	15.2
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	24.65
Kolmogorov-Smirnov Test Statistic	0.254	95% Percentile Bootstrap UCL	13.76
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	14.58
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17.24
		97.5% Chebyshev(Mean, Sd) UCL	19.73
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	24.62
95% Approximate Gamma UCL	14.04		
95% Adjusted Gamma UCL	14.48		

Potential UCL to Use		Use 95% Approximate Gamma UCL	14.04

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Cadmium was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Cesium-137

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.19	Minimum of Log Data	-1.661
Maximum	0.62	Maximum of Log Data	-0.478
Mean	0.405	Mean of log Data	-0.931
Median	0.405	SD of log Data	0.26
SD	0.0917		
Coefficient of Variation	0.226		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.563
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.453	95% H-UCL	0.473
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.54
95% Adjusted-CLT UCL (Chen-1995)	0.449	97.5% Chebyshev (MVUE) UCL	0.598
95% Modified-t UCL (Johnson-1978)	0.453	99% Chebyshev (MVUE) UCL	0.712

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	13.77	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0294		
MLE of Mean	0.405		
MLE of Standard Deviation	0.109		
nu star	330.6		
Approximate Chi Square Value (.05)	289.4	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	0.449
Adjusted Chi Square Value	283.6	95% Jackknife UCL	0.453
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.765	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.448	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.52
		97.5% Chebyshev(Mean, Sd) UCL	0.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.668
95% Approximate Gamma UCL	0.463		
95% Adjusted Gamma UCL	0.472		

Potential UCL to Use			
		Use 95% Student's-t UCL	0.453
		or 95% Modified-t UCL	0.453

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	26.3	Minimum of Log Data	3.27
Maximum	85	Maximum of Log Data	4.443
Mean	60.19	Mean of log Data	3.997
Median	65.72	SD of log Data	0.483
SD	26.31		
Coefficient of Variation	0.437		
Skewness	-0.0986		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.741	Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	73.83	95% H-UCL	83.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	98.11
95% Adjusted-CLT UCL (Chen-1995)	72.45	97.5% Chebyshev (MVUE) UCL	114.4
95% Modified-t UCL (Johnson-1978)	73.79	99% Chebyshev (MVUE) UCL	146.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.903	Data do not follow a Discernable Distribution (0.05)	
Theta Star	15.42		
MLE of Mean	60.19		
MLE of Standard Deviation	30.47		
nu star	93.66		
Approximate Chi Square Value (.05)	72.34	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	72.68
Adjusted Chi Square Value	69.49	95% Jackknife UCL	73.83
		95% Standard Bootstrap UCL	71.96
Anderson-Darling Test Statistic	1.386	95% Bootstrap-t UCL	74.29
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	70.71
Kolmogorov-Smirnov Test Statistic	0.335	95% Percentile Bootstrap UCL	72.29
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	72.15
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	93.3
		97.5% Chebyshev(Mean, Sd) UCL	107.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	135.8
95% Approximate Gamma UCL	77.93		
95% Adjusted Gamma UCL	81.13		
Potential UCL to Use		Use 95% Student's-t UCL	73.83
		or 95% Modified-t UCL	73.79

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	2

Raw Statistics		Log-transformed Statistics	
Minimum	1.13	Minimum of Log Data	0.122
Maximum	10	Maximum of Log Data	2.303
Mean	9.261	Mean of log Data	2.121
Median	10	SD of log Data	0.629
SD	2.561		
Coefficient of Variation	0.276		
Skewness	-3.464		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.327	Shapiro Wilk Test Statistic	0.327
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.59	95% H-UCL	15.76
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18.15
95% Adjusted-CLT UCL (Chen-1995)	9.687	97.5% Chebyshev (MVUE) UCL	21.69
95% Modified-t UCL (Johnson-1978)	10.47	99% Chebyshev (MVUE) UCL	28.64

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.751	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.469		
MLE of Mean	9.261		
MLE of Standard Deviation	4.782		
nu star	90.01		
Approximate Chi Square Value (.05)	69.14	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.48
Adjusted Chi Square Value	66.35	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.142	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.543	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.48
		97.5% Chebyshev(Mean, Sd) UCL	13.88
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.62
95% Approximate Gamma UCL	12.06		
95% Adjusted Gamma UCL	12.56		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.48
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	2.99	Minimum of Log Data	1.095
Maximum	16	Maximum of Log Data	2.773
Mean	9.495	Mean of log Data	2.198
Median	9.495	SD of log Data	0.378
SD	2.774		
Coefficient of Variation	0.292		
Skewness	-3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.536
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.93	95% H-UCL	12.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.26
95% Adjusted-CLT UCL (Chen-1995)	10.81	97.5% Chebyshev (MVUE) UCL	16.26
95% Modified-t UCL (Johnson-1978)	10.93	99% Chebyshev (MVUE) UCL	20.21

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.304		
MLE of Mean	9.495		
MLE of Standard Deviation	3.519		
nu star	174.7		
Approximate Chi Square Value (.05)	145.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	10.81
Adjusted Chi Square Value	141	95% Jackknife UCL	10.93
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.813	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.46	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.99
		97.5% Chebyshev(Mean, Sd) UCL	14.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.46
95% Approximate Gamma UCL	11.43		
95% Adjusted Gamma UCL	11.76		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.93
	or 95% Modified-t UCL	10.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		**Log-transformed Statistics**	
Minimum	147.3	Minimum of Log Data	4.993
Maximum	1725	Maximum of Log Data	7.453
Mean	538.1	Mean of log Data	5.992
Median	327.7	SD of log Data	0.757
SD	495.5		
Coefficient of Variation	0.921		
Skewness	1.792		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.733	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	795	95% H-UCL	943.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1034
95% Adjusted-CLT UCL (Chen-1995)	852.5	97.5% Chebyshev (MVUE) UCL	1258
95% Modified-t UCL (Johnson-1978)	807.3	99% Chebyshev (MVUE) UCL	1697
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.434	Data appear Lognormal at 5% Significance Level	
Theta Star	375.2		
MLE of Mean	538.1		
MLE of Standard Deviation	449.3		
nu star	34.42		
Approximate Chi Square Value (.05)	22	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	773.4
Adjusted Chi Square Value	20.5	95% Jackknife UCL	795
		95% Standard Bootstrap UCL	768.4
Anderson-Darling Test Statistic	0.784	95% Bootstrap-t UCL	1209
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	1934
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	786.2
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	844.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1162
		97.5% Chebyshev(Mean, Sd) UCL	1431
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1961
95% Approximate Gamma UCL	841.9		
95% Adjusted Gamma UCL	903.7		
Potential UCL to Use		Use 95% H-UCL	943.4

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	2
Raw Statistics		Log-transformed Statistics	
Minimum	5	Minimum of Log Data	1.609
Maximum	10	Maximum of Log Data	2.303
Mean	5.833	Mean of log Data	1.725
Median	5	SD of log Data	0.27
SD	1.946		
Coefficient of Variation	0.334		
Skewness	2.055		

Warning: There are only 2 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.465	Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.842	95% H-UCL	6.793
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.787
95% Adjusted-CLT UCL (Chen-1995)	7.114	97.5% Chebyshev (MVUE) UCL	8.645
95% Modified-t UCL (Johnson-1978)	6.898	99% Chebyshev (MVUE) UCL	10.33
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.887	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.59		
MLE of Mean	5.833		
MLE of Standard Deviation	1.855		
nu star	237.3		
Approximate Chi Square Value (.05)	202.6	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	6.757
Adjusted Chi Square Value	197.7	95% Jackknife UCL	N/A
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.442	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.507	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.282
		97.5% Chebyshev(Mean, Sd) UCL	9.342
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.42
95% Approximate Gamma UCL	6.831		
95% Adjusted Gamma UCL	7		
Potential UCL to Use		Use 95% Student's-t UCL	6.842
		or 95% Modified-t UCL	6.898

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Technetium-99

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	166	Minimum of Log Data	5.112
Maximum	215	Maximum of Log Data	5.371
Mean	190.5	Mean of log Data	5.248
Median	190.5	SD of log Data	0.0552
SD	10.45		
Coefficient of Variation	0.0548		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.597
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	195.9	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	203.7
95% Adjusted-CLT UCL (Chen-1995)	195.5	97.5% Chebyshev (MVUE) UCL	209.5
95% Modified-t UCL (Johnson-1978)	195.9	99% Chebyshev (MVUE) UCL	220.7

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	270	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.706		
MLE of Mean	190.5		
MLE of Standard Deviation	11.59		
nu star	6480		
Approximate Chi Square Value (.05)	6294	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	195.5
Adjusted Chi Square Value	6266	95% Jackknife UCL	195.9
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.716	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	203.6
		97.5% Chebyshev(Mean, Sd) UCL	209.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	220.5
95% Approximate Gamma UCL	196.1		
95% Adjusted Gamma UCL	197		

Potential UCL to Use		
	Use 95% Student's-t UCL	195.9
	or 95% Modified-t UCL	195.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	21.77	Minimum of Log Data	3.081
Maximum	4600	Maximum of Log Data	8.434
Mean	665	Mean of log Data	5.562
Median	275.1	SD of log Data	1.37
SD	1266		
Coefficient of Variation	1.904		
Skewness	3.216		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.503	Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1321	95% H-UCL	2978
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1687
95% Adjusted-CLT UCL (Chen-1995)	1629	97.5% Chebyshev (MVUE) UCL	2164
95% Modified-t UCL (Johnson-1978)	1378	99% Chebyshev (MVUE) UCL	3101
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.544	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1223		
MLE of Mean	665		
MLE of Standard Deviation	901.9		
nu star	13.05		
Approximate Chi Square Value (.05)	5.925	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1266
Adjusted Chi Square Value	5.21	95% Jackknife UCL	1321
		95% Standard Bootstrap UCL	1236
Anderson-Darling Test Statistic	0.72	95% Bootstrap-t UCL	3512
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	3417
Kolmogorov-Smirnov Test Statistic	0.252	95% Percentile Bootstrap UCL	1341
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	1751
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2258
		97.5% Chebyshev(Mean, Sd) UCL	2947
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4302
95% Approximate Gamma UCL	1464		
95% Adjusted Gamma UCL	1665		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1464

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	43.2	Minimum of Log Data	3.766
Maximum	1070	Maximum of Log Data	6.975
Mean	556.6	Mean of log Data	6.163
Median	556.6	SD of log Data	0.778
SD	218.9		
Coefficient of Variation	0.393		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.464
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	670.1	95% H-UCL	1165
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1264
95% Adjusted-CLT UCL (Chen-1995)	660.5	97.5% Chebyshev (MVUE) UCL	1541
95% Modified-t UCL (Johnson-1978)	670.1	99% Chebyshev (MVUE) UCL	2085
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.539	Data do not follow a Discernable Distribution (0.05)	
Theta Star	219.2		
MLE of Mean	556.6		
MLE of Standard Deviation	349.3		
nu star	60.93		
Approximate Chi Square Value (.05)	43.98	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	660.5
Adjusted Chi Square Value	41.79	95% Jackknife UCL	670.1
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.013	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.49	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	832.1
		97.5% Chebyshev(Mean, Sd) UCL	951.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1185
95% Approximate Gamma UCL	771.1		
95% Adjusted Gamma UCL	811.5		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	832.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	3.32	Minimum of Log Data	1.2
Maximum	70	Maximum of Log Data	4.248
Mean	36.66	Mean of log Data	3.455
Median	36.66	SD of log Data	0.734
SD	14.22		
Coefficient of Variation	0.388		
Skewness	2.8E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.47
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	44.03	95% H-UCL	71.59
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	79.35
95% Adjusted-CLT UCL (Chen-1995)	43.41	97.5% Chebyshev (MVUE) UCL	96.21
95% Modified-t UCL (Johnson-1978)	44.03	99% Chebyshev (MVUE) UCL	129.3

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.738	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.39		
MLE of Mean	36.66		
MLE of Standard Deviation	22.15		
nu star	65.72		
Approximate Chi Square Value (.05)	48.07	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	43.41
Adjusted Chi Square Value	45.77	95% Jackknife UCL	44.03
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.99	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	54.55
		97.5% Chebyshev(Mean, Sd) UCL	62.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	77.49
95% Approximate Gamma UCL	50.12		
95% Adjusted Gamma UCL	52.64		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	54.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	73.5	Minimum of Log Data	4.297
Maximum	1540	Maximum of Log Data	7.34
Mean	806.8	Mean of log Data	6.547
Median	806.8	SD of log Data	0.733
SD	312.7		
Coefficient of Variation	0.388		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.47
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	968.8	95% H-UCL	1571
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1743
95% Adjusted-CLT UCL (Chen-1995)	955.2	97.5% Chebyshev (MVUE) UCL	2113
95% Modified-t UCL (Johnson-1978)	968.8	99% Chebyshev (MVUE) UCL	2840

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.747	Data do not follow a Discernable Distribution (0.05)	
Theta Star	293.7		
MLE of Mean	806.8		
MLE of Standard Deviation	486.8		
nu star	65.92		
Approximate Chi Square Value (.05)	48.24	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	955.2
Adjusted Chi Square Value	45.94	95% Jackknife UCL	968.8
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.989	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.487	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.247	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1200
		97.5% Chebyshev(Mean, Sd) UCL	1370
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1705
95% Approximate Gamma UCL	1102		
95% Adjusted Gamma UCL	1158		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1200

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	14-10.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Arsenic

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	9
Raw Statistics		Log-transformed Statistics	
Minimum	6.2	Minimum of Log Data	1.825
Maximum	13.37	Maximum of Log Data	2.593
Mean	10.28	Mean of log Data	2.314
Median	10.82	SD of log Data	0.202
SD	1.843		
Coefficient of Variation	0.179		
Skewness	-0.95		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.886	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	11.24	95% H-UCL	11.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.92
95% Adjusted-CLT UCL (Chen-1995)	11	97.5% Chebyshev (MVUE) UCL	14.06
95% Modified-t UCL (Johnson-1978)	11.22	99% Chebyshev (MVUE) UCL	16.29
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	22.06	Data appear Normal at 5% Significance Level	
Theta Star	0.466		
MLE of Mean	10.28		
MLE of Standard Deviation	2.19		
nu star	529.5		
Approximate Chi Square Value (.05)	477.1	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	11.16
Adjusted Chi Square Value	469.5	95% Jackknife UCL	11.24
		95% Standard Bootstrap UCL	11.13
Anderson-Darling Test Statistic	0.921	95% Bootstrap-t UCL	11.08
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	11.08
Kolmogorov-Smirnov Test Statistic	0.231	95% Percentile Bootstrap UCL	11.09
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	11.01
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.6
		97.5% Chebyshev(Mean, Sd) UCL	13.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.58
95% Approximate Gamma UCL	11.41		
95% Adjusted Gamma UCL	11.6		
Potential UCL to Use		Use 95% Student's-t UCL	11.24

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	32.24	Minimum of Log Data	3.473
Maximum	85	Maximum of Log Data	4.443
Mean	58.51	Mean of log Data	3.986
Median	50.18	SD of log Data	0.429
SD	24.3		
Coefficient of Variation	0.415		
Skewness	0.186		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.752	Shapiro Wilk Test Statistic	0.779
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	71.1	95% H-UCL	77.05
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.75
95% Adjusted-CLT UCL (Chen-1995)	70.45	97.5% Chebyshev (MVUE) UCL	104.7
95% Modified-t UCL (Johnson-1978)	71.17	99% Chebyshev (MVUE) UCL	132
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.688	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.48		
MLE of Mean	58.51		
MLE of Standard Deviation	27.02		
nu star	112.5		
Approximate Chi Square Value (.05)	89.03	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	70.04
Adjusted Chi Square Value	85.84	95% Jackknife UCL	71.1
		95% Standard Bootstrap UCL	69.41
Anderson-Darling Test Statistic	1.288	95% Bootstrap-t UCL	71.61
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	67.99
Kolmogorov-Smirnov Test Statistic	0.285	95% Percentile Bootstrap UCL	69.8
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	70.18
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	89.08
		97.5% Chebyshev(Mean, Sd) UCL	102.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	128.3
95% Approximate Gamma UCL	73.94		
95% Adjusted Gamma UCL	76.68		
Potential UCL to Use		Use 95% Student's-t UCL	71.1
		or 95% Modified-t UCL	71.17

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	35	Minimum of Log Data	3.555
Maximum	275.7	Maximum of Log Data	5.619
Mean	97.86	Mean of log Data	4.384
Median	84.67	SD of log Data	0.653
SD	69.09		
Coefficient of Variation	0.706		
Skewness	1.682		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.834	Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	133.7	95% H-UCL	157.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	180
95% Adjusted-CLT UCL (Chen-1995)	141	97.5% Chebyshev (MVUE) UCL	215.8
95% Modified-t UCL (Johnson-1978)	135.3	99% Chebyshev (MVUE) UCL	286.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.054	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	47.64		
MLE of Mean	97.86		
MLE of Standard Deviation	68.28		
nu star	49.3		
Approximate Chi Square Value (.05)	34.18	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	130.7
Adjusted Chi Square Value	32.27	95% Jackknife UCL	133.7
		95% Standard Bootstrap UCL	129.2
Anderson-Darling Test Statistic	0.311	95% Bootstrap-t UCL	157.9
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	291.6
Kolmogorov-Smirnov Test Statistic	0.138	95% Percentile Bootstrap UCL	130.6
Kolmogorov-Smirnov 5% Critical Value	0.248	95% BCA Bootstrap UCL	142.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	184.8
		97.5% Chebyshev(Mean, Sd) UCL	222.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	296.3
95% Approximate Gamma UCL	141.2		
95% Adjusted Gamma UCL	149.5		
Potential UCL to Use		Use 95% Approximate Gamma UCL	141.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	11544	Minimum of Log Data	9.354
Maximum	39015	Maximum of Log Data	10.57
Mean	23033	Mean of log Data	9.985
Median	20803	SD of log Data	0.359
SD	8520		
Coefficient of Variation	0.37		
Skewness	0.861		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.91	Shapiro Wilk Test Statistic	0.963
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	27450	95% H-UCL	28677
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33531
95% Adjusted-CLT UCL (Chen-1995)	27732	97.5% Chebyshev (MVUE) UCL	38083
95% Modified-t UCL (Johnson-1978)	27552	99% Chebyshev (MVUE) UCL	47025
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.46	Data appear Normal at 5% Significance Level	
Theta Star	3566		
MLE of Mean	23033		
MLE of Standard Deviation	9062		
nu star	155		
Approximate Chi Square Value (.05)	127.3	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	27078
Adjusted Chi Square Value	123.4	95% Jackknife UCL	27450
		95% Standard Bootstrap UCL	26855
Anderson-Darling Test Statistic	0.316	95% Bootstrap-t UCL	28720
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	29319
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	27066
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	27390
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33754
		97.5% Chebyshev(Mean, Sd) UCL	38393
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	47505
95% Approximate Gamma UCL	28062		
95% Adjusted Gamma UCL	28934		
Potential UCL to Use		Use 95% Student's-t UCL	27450

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.92	Minimum of Log Data	-0.0834
Maximum	43.71	Maximum of Log Data	3.778
Mean	12.1	Mean of log Data	2.229
Median	10	SD of log Data	0.846
SD	10.32		
Coefficient of Variation	0.853		
Skewness	2.98		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.517	Shapiro Wilk Test Statistic	0.633
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	17.46	95% H-UCL	26.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.17
95% Adjusted-CLT UCL (Chen-1995)	19.74	97.5% Chebyshev (MVUE) UCL	33.39
95% Modified-t UCL (Johnson-1978)	17.88	99% Chebyshev (MVUE) UCL	45.61
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.587	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.625		
MLE of Mean	12.1		
MLE of Standard Deviation	9.607		
nu star	38.09		
Approximate Chi Square Value (.05)	24.96	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	17.01
Adjusted Chi Square Value	23.35	95% Jackknife UCL	17.46
		95% Standard Bootstrap UCL	16.94
Anderson-Darling Test Statistic	2.221	95% Bootstrap-t UCL	39.43
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	43.9
Kolmogorov-Smirnov Test Statistic	0.344	95% Percentile Bootstrap UCL	17.67
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	18.78
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	25.09
		97.5% Chebyshev(Mean, Sd) UCL	30.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	41.76
95% Approximate Gamma UCL	18.47		
95% Adjusted Gamma UCL	19.75		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	25.09

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	950.8	Maximum of Log Data	6.857
Mean	442.4	Mean of log Data	5.791
Median	445.1	SD of log Data	0.897
SD	304.7		
Coefficient of Variation	0.689		
Skewness	0.41		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.897	Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	600.4	95% H-UCL	1024
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1029
95% Adjusted-CLT UCL (Chen-1995)	598.2	97.5% Chebyshev (MVUE) UCL	1272
95% Modified-t UCL (Johnson-1978)	602.1	99% Chebyshev (MVUE) UCL	1748
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.41	Data appear Normal at 5% Significance Level	
Theta Star	313.8		
MLE of Mean	442.4		
MLE of Standard Deviation	372.6		
nu star	33.84		
Approximate Chi Square Value (.05)	21.54	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	587.1
Adjusted Chi Square Value	20.05	95% Jackknife UCL	600.4
		95% Standard Bootstrap UCL	581.1
Anderson-Darling Test Statistic	0.587	95% Bootstrap-t UCL	621.5
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	591.8
Kolmogorov-Smirnov Test Statistic	0.222	95% Percentile Bootstrap UCL	588.5
Kolmogorov-Smirnov 5% Critical Value	0.249	95% BCA Bootstrap UCL	590.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	825.8
		97.5% Chebyshev(Mean, Sd) UCL	991.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1317
95% Approximate Gamma UCL	695.2		
95% Adjusted Gamma UCL	746.7		
Potential UCL to Use		Use 95% Student's-t UCL	600.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	1.1	Minimum of Log Data	0.0953
Maximum	10	Maximum of Log Data	2.303
Mean	6.009	Mean of log Data	1.672
Median	5	SD of log Data	0.582
SD	2.68		
Coefficient of Variation	0.446		
Skewness	0.369		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.784	Shapiro Wilk Test Statistic	0.715
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.398	95% H-UCL	9.345
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.88
95% Adjusted-CLT UCL (Chen-1995)	7.37	97.5% Chebyshev (MVUE) UCL	12.91
95% Modified-t UCL (Johnson-1978)	7.412	99% Chebyshev (MVUE) UCL	16.89
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.264	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.841		
MLE of Mean	6.009		
MLE of Standard Deviation	3.326		
nu star	78.34		
Approximate Chi Square Value (.05)	58.95	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	7.282
Adjusted Chi Square Value	56.39	95% Jackknife UCL	7.398
		95% Standard Bootstrap UCL	7.233
Anderson-Darling Test Statistic	1.351	95% Bootstrap-t UCL	7.501
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	7.477
Kolmogorov-Smirnov Test Statistic	0.336	95% Percentile Bootstrap UCL	7.252
Kolmogorov-Smirnov 5% Critical Value	0.246	95% BCA Bootstrap UCL	7.252
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.381
		97.5% Chebyshev(Mean, Sd) UCL	10.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.71
95% Approximate Gamma UCL	7.986		
95% Adjusted Gamma UCL	8.348		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	9.381

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	12	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	14.07	Minimum of Log Data	2.644
Maximum	542	Maximum of Log Data	6.295
Mean	203.3	Mean of log Data	4.794
Median	200.1	SD of log Data	1.274
SD	164.2		
Coefficient of Variation	0.808		
Skewness	0.648		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.849
Shapiro Wilk Critical Value	0.859	Shapiro Wilk Critical Value	0.859
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	288.4	95% H-UCL	1017
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	671.2
95% Adjusted-CLT UCL (Chen-1995)	290.7	97.5% Chebyshev (MVUE) UCL	855.8
95% Modified-t UCL (Johnson-1978)	289.9	99% Chebyshev (MVUE) UCL	1218
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.878	Data appear Normal at 5% Significance Level	
Theta Star	231.5		
MLE of Mean	203.3		
MLE of Standard Deviation	216.9		
nu star	21.07		
Approximate Chi Square Value (.05)	11.64	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	281.3
Adjusted Chi Square Value	10.59	95% Jackknife UCL	288.4
		95% Standard Bootstrap UCL	280.8
Anderson-Darling Test Statistic	0.648	95% Bootstrap-t UCL	303.1
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	305.7
Kolmogorov-Smirnov Test Statistic	0.27	95% Percentile Bootstrap UCL	278
Kolmogorov-Smirnov 5% Critical Value	0.252	95% BCA Bootstrap UCL	286.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	409.9
		97.5% Chebyshev(Mean, Sd) UCL	499.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	675
95% Approximate Gamma UCL	367.8		
95% Adjusted Gamma UCL	404.5		
Potential UCL to Use		Use 95% Student's-t UCL	288.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-234

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-234 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-235

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	12	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	518-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	22	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	4.43	Minimum of Log Data	1.488
Maximum	9.3	Maximum of Log Data	2.23
Mean	6.051	Mean of log Data	1.787
Median	6.051	SD of log Data	0.162
SD	1.075		
Coefficient of Variation	0.178		
Skewness	1.794		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.68	Shapiro Wilk Test Statistic	0.736
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	6.446	95% H-UCL	6.437
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.96
95% Adjusted-CLT UCL (Chen-1995)	6.522	97.5% Chebyshev (MVUE) UCL	7.355
95% Modified-t UCL (Johnson-1978)	6.46	99% Chebyshev (MVUE) UCL	8.132
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	32.86	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.184		
MLE of Mean	6.051		
MLE of Standard Deviation	1.056		
nu star	1446		
Approximate Chi Square Value (.05)	1358	Nonparametric Statistics	
Adjusted Level of Significance	0.0386	95% CLT UCL	6.428
Adjusted Chi Square Value	1352	95% Jackknife UCL	6.446
		95% Standard Bootstrap UCL	6.417
Anderson-Darling Test Statistic	3.01	95% Bootstrap-t UCL	6.68
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	9.142
Kolmogorov-Smirnov Test Statistic	0.388	95% Percentile Bootstrap UCL	6.434
Kolmogorov-Smirnov 5% Critical Value	0.185	95% BCA Bootstrap UCL	6.529
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	7.05
		97.5% Chebyshev(Mean, Sd) UCL	7.482
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	8.331
95% Approximate Gamma UCL	6.44		
95% Adjusted Gamma UCL	6.47		
Potential UCL to Use		Use 95% Student's-t UCL	6.446
		or 95% Modified-t UCL	6.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Carbazole

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.46	Minimum of Log Data	-0.777
Maximum	37	Maximum of Log Data	3.611
Mean	4.634	Mean of log Data	0.737
Median	4.634	SD of log Data	1.327
SD	7.625		
Coefficient of Variation	1.645		
Skewness	3.937		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.479	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.431	95% H-UCL	12.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.6
95% Adjusted-CLT UCL (Chen-1995)	8.766	97.5% Chebyshev (MVUE) UCL	14.58
95% Modified-t UCL (Johnson-1978)	7.658	99% Chebyshev (MVUE) UCL	20.43
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.679	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.82		
MLE of Mean	4.634		
MLE of Standard Deviation	5.622		
nu star	29.9		
Approximate Chi Square Value (.05)	18.41	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	7.308
Adjusted Chi Square Value	17.74	95% Jackknife UCL	7.431
		95% Standard Bootstrap UCL	7.237
Anderson-Darling Test Statistic	1.956	95% Bootstrap-t UCL	11.57
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	18.1
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	7.546
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	9.729
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.72
		97.5% Chebyshev(Mean, Sd) UCL	14.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.81
95% Approximate Gamma UCL	7.524		
95% Adjusted Gamma UCL	7.81		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.5	Minimum of Log Data	0.916
Maximum	17.6	Maximum of Log Data	2.868
Mean	5.77	Mean of log Data	1.683
Median	5.77	SD of log Data	0.351
SD	2.817		
Coefficient of Variation	0.488		
Skewness	3.719		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.484	Shapiro Wilk Test Statistic	0.691
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	6.804	95% H-UCL	6.607
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.604
95% Adjusted-CLT UCL (Chen-1995)	7.267	97.5% Chebyshev (MVUE) UCL	8.425
95% Modified-t UCL (Johnson-1978)	6.883	99% Chebyshev (MVUE) UCL	10.04
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.396	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.902		
MLE of Mean	5.77		
MLE of Standard Deviation	2.282		
nu star	281.4		
Approximate Chi Square Value (.05)	243.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	6.758
Adjusted Chi Square Value	240.9	95% Jackknife UCL	6.804
		95% Standard Bootstrap UCL	6.735
Anderson-Darling Test Statistic	3.296	95% Bootstrap-t UCL	7.774
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	11.14
Kolmogorov-Smirnov Test Statistic	0.406	95% Percentile Bootstrap UCL	6.928
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	7.352
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.388
		97.5% Chebyshev(Mean, Sd) UCL	9.521
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.75
95% Approximate Gamma UCL	6.667		
95% Adjusted Gamma UCL	6.739		
Potential UCL to Use		Use 95% Student's-t UCL	6.804
		or 95% Modified-t UCL	6.883

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.9	Minimum of Log Data	1.932
Maximum	24.8	Maximum of Log Data	3.211
Mean	11.65	Mean of log Data	2.425
Median	11.65	SD of log Data	0.238
SD	3.304		
Coefficient of Variation	0.284		
Skewness	2.969		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.536	Shapiro Wilk Test Statistic	0.648
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.86	95% H-UCL	12.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.21
95% Adjusted-CLT UCL (Chen-1995)	13.28	97.5% Chebyshev (MVUE) UCL	15.33
95% Modified-t UCL (Johnson-1978)	12.93	99% Chebyshev (MVUE) UCL	17.53
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.81	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.787		
MLE of Mean	11.65		
MLE of Standard Deviation	3.026		
nu star	651.5		
Approximate Chi Square Value (.05)	593.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	12.8
Adjusted Chi Square Value	589.1	95% Jackknife UCL	12.86
		95% Standard Bootstrap UCL	12.76
Anderson-Darling Test Statistic	3.825	95% Bootstrap-t UCL	13.45
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	18.49
Kolmogorov-Smirnov Test Statistic	0.377	95% Percentile Bootstrap UCL	12.88
Kolmogorov-Smirnov 5% Critical Value	0.185	95% BCA Bootstrap UCL	13.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.72
		97.5% Chebyshev(Mean, Sd) UCL	16.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.66
95% Approximate Gamma UCL	12.79		
95% Adjusted Gamma UCL	12.88		
Potential UCL to Use		Use 95% Student's-t UCL	12.86
		or 95% Modified-t UCL	12.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.318	Mean of log Data	-1.445
Median	0.318	SD of log Data	0.728
SD	0.336		
Coefficient of Variation	1.056		
Skewness	3.26		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.557	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.441	95% H-UCL	0.438
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.523
95% Adjusted-CLT UCL (Chen-1995)	0.489	97.5% Chebyshev (MVUE) UCL	0.618
95% Modified-t UCL (Johnson-1978)	0.45	99% Chebyshev (MVUE) UCL	0.805
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.599	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.199		
MLE of Mean	0.318		
MLE of Standard Deviation	0.252		
nu star	70.34		
Approximate Chi Square Value (.05)	52.03	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	0.436
Adjusted Chi Square Value	50.85	95% Jackknife UCL	0.441
		95% Standard Bootstrap UCL	0.432
Anderson-Darling Test Statistic	1.938	95% Bootstrap-t UCL	0.617
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	1.034
Kolmogorov-Smirnov Test Statistic	0.31	95% Percentile Bootstrap UCL	0.442
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	0.497
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.63
		97.5% Chebyshev(Mean, Sd) UCL	0.766
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.031
95% Approximate Gamma UCL	0.43		
95% Adjusted Gamma UCL	0.44		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Pyrene

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	14
Raw Statistics		Log-transformed Statistics	
Minimum	0.098	Minimum of Log Data	-2.323
Maximum	150	Maximum of Log Data	5.011
Mean	22.33	Mean of log Data	1.995
Median	22.33	SD of log Data	1.89
SD	32.44		
Coefficient of Variation	1.453		
Skewness	3.138		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	34.24	95% H-UCL	228.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.4
95% Adjusted-CLT UCL (Chen-1995)	38.65	97.5% Chebyshev (MVUE) UCL	151
95% Modified-t UCL (Johnson-1978)	35.01	99% Chebyshev (MVUE) UCL	219
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.515	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	43.34		
MLE of Mean	22.33		
MLE of Standard Deviation	31.11		
nu star	22.67		
Approximate Chi Square Value (.05)	12.84	Nonparametric Statistics	
Adjusted Level of Significance	0.0386	95% CLT UCL	33.71
Adjusted Chi Square Value	12.29	95% Jackknife UCL	34.24
		95% Standard Bootstrap UCL	33.16
Anderson-Darling Test Statistic	0.683	95% Bootstrap-t UCL	45.92
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	81.26
Kolmogorov-Smirnov Test Statistic	0.219	95% Percentile Bootstrap UCL	34.5
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	39.83
Data follow Appr. Gamma Distribution at 5% Significance Lev		95% Chebyshev(Mean, Sd) UCL	52.48
		97.5% Chebyshev(Mean, Sd) UCL	65.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	91.15
95% Approximate Gamma UCL	39.43		
95% Adjusted Gamma UCL	41.19		
Potential UCL to Use		Use 95% Approximate Gamma UCL	39.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	0.0872	Minimum of Log Data	-2.44
Maximum	111.8	Maximum of Log Data	4.717
Mean	16.66	Mean of log Data	1.717
Median	16.66	SD of log Data	1.872
SD	24		
Coefficient of Variation	1.441		
Skewness	3.201		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.614	Shapiro Wilk Test Statistic	0.893
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.46	95% H-UCL	162.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.05
95% Adjusted-CLT UCL (Chen-1995)	28.8	97.5% Chebyshev (MVUE) UCL	110.3
95% Modified-t UCL (Johnson-1978)	26.04	99% Chebyshev (MVUE) UCL	159.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.521	Data do not follow a Discernable Distribution (0.05)	
Theta Star	31.95		
MLE of Mean	16.66		
MLE of Standard Deviation	23.07		
nu star	22.94		
Approximate Chi Square Value (.05)	13.05	Nonparametric Statistics	
Adjusted Level of Significance	0.0386	95% CLT UCL	25.07
Adjusted Chi Square Value	12.49	95% Jackknife UCL	25.46
		95% Standard Bootstrap UCL	24.61
Anderson-Darling Test Statistic	0.928	95% Bootstrap-t UCL	33.63
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	61.57
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	26.02
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	29.33
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38.96
		97.5% Chebyshev(Mean, Sd) UCL	48.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	67.56
95% Approximate Gamma UCL	29.29		
95% Adjusted Gamma UCL	30.59		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	38.96

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics

Number of Valid Observations	22	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	9.12	Minimum of Log Data	2.21
Maximum	2000	Maximum of Log Data	7.601
Mean	885.2	Mean of log Data	6.52
Median	885.2	SD of log Data	1.089
SD	445.6		
Coefficient of Variation	0.503		
Skewness	0.875		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.656	Shapiro Wilk Test Statistic	0.51
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1049	95% H-UCL	2338
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2545
95% Adjusted-CLT UCL (Chen-1995)	1060	97.5% Chebyshev (MVUE) UCL	3136
95% Modified-t UCL (Johnson-1978)	1052	99% Chebyshev (MVUE) UCL	4297
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.788	Data do not follow a Discernable Distribution (0.05)	
Theta Star	495.2		
MLE of Mean	885.2		
MLE of Standard Deviation	662.1		
nu star	78.66		
Approximate Chi Square Value (.05)	59.23	Nonparametric Statistics	
Adjusted Level of Significance	0.0386	95% CLT UCL	1041
Adjusted Chi Square Value	57.97	95% Jackknife UCL	1049
		95% Standard Bootstrap UCL	1041
Anderson-Darling Test Statistic	4.231	95% Bootstrap-t UCL	1088
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	1234
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	1048
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	1058
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1299
		97.5% Chebyshev(Mean, Sd) UCL	1478
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1830
95% Approximate Gamma UCL	1176		
95% Adjusted Gamma UCL	1201		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1299

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.024	Minimum of Log Data	-3.73
Maximum	0.163	Maximum of Log Data	-1.814
Mean	0.058	Mean of log Data	-2.914
Median	0.058	SD of log Data	0.357
SD	0.0258		
Coefficient of Variation	0.444		
Skewness	3.291		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.494	Shapiro Wilk Test Statistic	0.649
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0674	95% H-UCL	0.067
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0772
95% Adjusted-CLT UCL (Chen-1995)	0.0711	97.5% Chebyshev (MVUE) UCL	0.0856
95% Modified-t UCL (Johnson-1978)	0.0681	99% Chebyshev (MVUE) UCL	0.102
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0087		
MLE of Mean	0.058		
MLE of Standard Deviation	0.0224		
nu star	294.8		
Approximate Chi Square Value (.05)	256	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	0.067
Adjusted Chi Square Value	253.3	95% Jackknife UCL	0.0674
		95% Standard Bootstrap UCL	0.0671
Anderson-Darling Test Statistic	3.991	95% Bootstrap-t UCL	0.073
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.109
Kolmogorov-Smirnov Test Statistic	0.407	95% Percentile Bootstrap UCL	0.0675
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	0.0735
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0819
		97.5% Chebyshev(Mean, Sd) UCL	0.0923
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.113
95% Approximate Gamma UCL	0.0668		
95% Adjusted Gamma UCL	0.0675		
Potential UCL to Use		Use 95% Student's-t UCL	0.0674
		or 95% Modified-t UCL	0.0681

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.684	Minimum of Log Data	-0.38
Maximum	3.04	Maximum of Log Data	1.112
Mean	1.361	Mean of log Data	0.274
Median	1.361	SD of log Data	0.258
SD	0.418		
Coefficient of Variation	0.307		
Skewness	3.066		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.505	Shapiro Wilk Test Statistic	0.618
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.514	95% H-UCL	1.505
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.686
95% Adjusted-CLT UCL (Chen-1995)	1.569	97.5% Chebyshev (MVUE) UCL	1.828
95% Modified-t UCL (Johnson-1978)	1.524	99% Chebyshev (MVUE) UCL	2.107
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	12.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.106		
MLE of Mean	1.361		
MLE of Standard Deviation	0.381		
nu star	562.5		
Approximate Chi Square Value (.05)	508.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	1.507
Adjusted Chi Square Value	504.6	95% Jackknife UCL	1.514
		95% Standard Bootstrap UCL	1.504
Anderson-Darling Test Statistic	4.217	95% Bootstrap-t UCL	1.595
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	2.223
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	1.513
Kolmogorov-Smirnov 5% Critical Value	0.185	95% BCA Bootstrap UCL	1.576
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.749
		97.5% Chebyshev(Mean, Sd) UCL	1.917
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.247
95% Approximate Gamma UCL	1.505		
95% Adjusted Gamma UCL	1.517		
Potential UCL to Use		Use 95% Student's-t UCL	1.514
		or 95% Modified-t UCL	1.524

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	518-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Carbazole

General Statistics

Number of Valid Observations	22	Number of Distinct Observations	10

Raw Statistics		Log-transformed Statistics	
Minimum	0.46	Minimum of Log Data	-0.777
Maximum	37	Maximum of Log Data	3.611
Mean	4.634	Mean of log Data	0.737
Median	4.634	SD of log Data	1.327
SD	7.625		
Coefficient of Variation	1.645		
Skewness	3.937		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.479	Shapiro Wilk Test Statistic	0.791
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	7.431	95% H-UCL	12.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.6
95% Adjusted-CLT UCL (Chen-1995)	8.766	97.5% Chebyshev (MVUE) UCL	14.58
95% Modified-t UCL (Johnson-1978)	7.658	99% Chebyshev (MVUE) UCL	20.43

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.679	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.82		
MLE of Mean	4.634		
MLE of Standard Deviation	5.622		
nu star	29.9		
Approximate Chi Square Value (.05)	18.41	Nonparametric Statistics	
Adjusted Level of Significance	0.0386	95% CLT UCL	7.308
Adjusted Chi Square Value	17.74	95% Jackknife UCL	7.431
		95% Standard Bootstrap UCL	7.268
Anderson-Darling Test Statistic	1.956	95% Bootstrap-t UCL	11.57
Anderson-Darling 5% Critical Value	0.783	95% Hall's Bootstrap UCL	18.12
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	7.688
Kolmogorov-Smirnov 5% Critical Value	0.193	95% BCA Bootstrap UCL	9.045
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.72
		97.5% Chebyshev(Mean, Sd) UCL	14.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.81
95% Approximate Gamma UCL	7.524		
95% Adjusted Gamma UCL	7.81		

Potential UCL to Use	Use 95% Chebyshev (Mean, Sd) UCL	11.72

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.5	Minimum of Log Data	0.916
Maximum	17.6	Maximum of Log Data	2.868
Mean	5.77	Mean of log Data	1.683
Median	5.77	SD of log Data	0.351
SD	2.817		
Coefficient of Variation	0.488		
Skewness	3.719		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.484	Shapiro Wilk Test Statistic	0.691
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	6.804	95% H-UCL	6.607
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	7.604
95% Adjusted-CLT UCL (Chen-1995)	7.267	97.5% Chebyshev (MVUE) UCL	8.425
95% Modified-t UCL (Johnson-1978)	6.883	99% Chebyshev (MVUE) UCL	10.04
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.396	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.902		
MLE of Mean	5.77		
MLE of Standard Deviation	2.282		
nu star	281.4		
Approximate Chi Square Value (.05)	243.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	6.758
Adjusted Chi Square Value	240.9	95% Jackknife UCL	6.804
		95% Standard Bootstrap UCL	6.743
Anderson-Darling Test Statistic	3.296	95% Bootstrap-t UCL	7.806
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	11.13
Kolmogorov-Smirnov Test Statistic	0.406	95% Percentile Bootstrap UCL	6.846
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	7.389
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	8.388
		97.5% Chebyshev(Mean, Sd) UCL	9.521
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.75
95% Approximate Gamma UCL	6.667		
95% Adjusted Gamma UCL	6.739		
Potential UCL to Use		Use 95% Student's-t UCL	6.804
		or 95% Modified-t UCL	6.883

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.9	Minimum of Log Data	1.932
Maximum	24.8	Maximum of Log Data	3.211
Mean	11.65	Mean of log Data	2.425
Median	11.65	SD of log Data	0.238
SD	3.304		
Coefficient of Variation	0.284		
Skewness	2.969		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.536	Shapiro Wilk Test Statistic	0.648
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.86	95% H-UCL	12.77
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.21
95% Adjusted-CLT UCL (Chen-1995)	13.28	97.5% Chebyshev (MVUE) UCL	15.33
95% Modified-t UCL (Johnson-1978)	12.93	99% Chebyshev (MVUE) UCL	17.53
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.81	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.787		
MLE of Mean	11.65		
MLE of Standard Deviation	3.026		
nu star	651.5		
Approximate Chi Square Value (.05)	593.3	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	12.8
Adjusted Chi Square Value	589.1	95% Jackknife UCL	12.86
		95% Standard Bootstrap UCL	12.77
Anderson-Darling Test Statistic	3.825	95% Bootstrap-t UCL	13.5
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	18.44
Kolmogorov-Smirnov Test Statistic	0.377	95% Percentile Bootstrap UCL	12.88
Kolmogorov-Smirnov 5% Critical Value	0.185	95% BCA Bootstrap UCL	13.29
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.72
		97.5% Chebyshev(Mean, Sd) UCL	16.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.66
95% Approximate Gamma UCL	12.79		
95% Adjusted Gamma UCL	12.88		
Potential UCL to Use		Use 95% Student's-t UCL	12.86
		or 95% Modified-t UCL	12.93

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.1	Minimum of Log Data	-2.303
Maximum	1.64	Maximum of Log Data	0.495
Mean	0.318	Mean of log Data	-1.445
Median	0.318	SD of log Data	0.728
SD	0.336		
Coefficient of Variation	1.056		
Skewness	3.26		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.557	Shapiro Wilk Test Statistic	0.826
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.441	95% H-UCL	0.438
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.523
95% Adjusted-CLT UCL (Chen-1995)	0.489	97.5% Chebyshev (MVUE) UCL	0.618
95% Modified-t UCL (Johnson-1978)	0.45	99% Chebyshev (MVUE) UCL	0.805
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.599	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.199		
MLE of Mean	0.318		
MLE of Standard Deviation	0.252		
nu star	70.34		
Approximate Chi Square Value (.05)	52.03	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	0.436
Adjusted Chi Square Value	50.85	95% Jackknife UCL	0.441
		95% Standard Bootstrap UCL	0.434
Anderson-Darling Test Statistic	1.938	95% Bootstrap-t UCL	0.617
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	1.028
Kolmogorov-Smirnov Test Statistic	0.31	95% Percentile Bootstrap UCL	0.447
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	0.505
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.63
		97.5% Chebyshev(Mean, Sd) UCL	0.766
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.031
95% Approximate Gamma UCL	0.43		
95% Adjusted Gamma UCL	0.44		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Pyrene

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	14
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.098	Minimum of Log Data	-2.323
Maximum	150	Maximum of Log Data	5.011
Mean	22.33	Mean of log Data	1.995
Median	22.33	SD of log Data	1.89
SD	32.44		
Coefficient of Variation	1.453		
Skewness	3.138		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk Test Statistic	0.915
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	34.24	95% H-UCL	228.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	116.4
95% Adjusted-CLT UCL (Chen-1995)	38.65	97.5% Chebyshev (MVUE) UCL	151
95% Modified-t UCL (Johnson-1978)	35.01	99% Chebyshev (MVUE) UCL	219
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.515	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	43.34		
MLE of Mean	22.33		
MLE of Standard Deviation	31.11		
nu star	22.67		
Approximate Chi Square Value (.05)	12.84	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	33.71
Adjusted Chi Square Value	12.29	95% Jackknife UCL	34.24
		95% Standard Bootstrap UCL	33.48
Anderson-Darling Test Statistic	0.683	95% Bootstrap-t UCL	45.9
Anderson-Darling 5% Critical Value	0.799	95% Hall's Bootstrap UCL	81.69
Kolmogorov-Smirnov Test Statistic	0.219	95% Percentile Bootstrap UCL	34.71
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	40.9
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	52.48
		97.5% Chebyshev(Mean, Sd) UCL	65.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	91.15
95% Approximate Gamma UCL	39.43		
95% Adjusted Gamma UCL	41.19		
Potential UCL to Use		Use 95% Approximate Gamma UCL	39.43

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	13
Raw Statistics		Log-transformed Statistics	
Minimum	0.0872	Minimum of Log Data	-2.44
Maximum	111.8	Maximum of Log Data	4.717
Mean	16.66	Mean of log Data	1.717
Median	16.66	SD of log Data	1.872
SD	24		
Coefficient of Variation	1.441		
Skewness	3.201		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.614	Shapiro Wilk Test Statistic	0.893
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	25.46	95% H-UCL	162.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	85.05
95% Adjusted-CLT UCL (Chen-1995)	28.8	97.5% Chebyshev (MVUE) UCL	110.3
95% Modified-t UCL (Johnson-1978)	26.04	99% Chebyshev (MVUE) UCL	159.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.521	Data do not follow a Discernable Distribution (0.05)	
Theta Star	31.95		
MLE of Mean	16.66		
MLE of Standard Deviation	23.07		
nu star	22.94		
Approximate Chi Square Value (.05)	13.05	Nonparametric Statistics	
Adjusted Level of Significance	0.0386	95% CLT UCL	25.07
Adjusted Chi Square Value	12.49	95% Jackknife UCL	25.46
		95% Standard Bootstrap UCL	25.02
Anderson-Darling Test Statistic	0.928	95% Bootstrap-t UCL	33.88
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	61.46
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	26.26
Kolmogorov-Smirnov 5% Critical Value	0.195	95% BCA Bootstrap UCL	29.95
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	38.96
		97.5% Chebyshev(Mean, Sd) UCL	48.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	67.56
95% Approximate Gamma UCL	29.29		
95% Adjusted Gamma UCL	30.59		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	38.96

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.12	Minimum of Log Data	2.21
Maximum	2000	Maximum of Log Data	7.601
Mean	885.2	Mean of log Data	6.52
Median	885.2	SD of log Data	1.089
SD	445.6		
Coefficient of Variation	0.503		
Skewness	0.875		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.656	Shapiro Wilk Test Statistic	0.51
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1049	95% H-UCL	2338
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2545
95% Adjusted-CLT UCL (Chen-1995)	1060	97.5% Chebyshev (MVUE) UCL	3136
95% Modified-t UCL (Johnson-1978)	1052	99% Chebyshev (MVUE) UCL	4297
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.788	Data do not follow a Discernable Distribution (0.05)	
Theta Star	495.2		
MLE of Mean	885.2		
MLE of Standard Deviation	662.1		
nu star	78.66		
Approximate Chi Square Value (.05)	59.23	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	1041
Adjusted Chi Square Value	57.97	95% Jackknife UCL	1049
		95% Standard Bootstrap UCL	1036
Anderson-Darling Test Statistic	4.231	95% Bootstrap-t UCL	1068
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	1234
Kolmogorov-Smirnov Test Statistic	0.457	95% Percentile Bootstrap UCL	1037
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	1058
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1299
		97.5% Chebyshev(Mean, Sd) UCL	1478
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1830
95% Approximate Gamma UCL	1176		
95% Adjusted Gamma UCL	1201		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1299

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.024	Minimum of Log Data	-3.73
Maximum	0.163	Maximum of Log Data	-1.814
Mean	0.058	Mean of log Data	-2.914
Median	0.058	SD of log Data	0.357
SD	0.0258		
Coefficient of Variation	0.444		
Skewness	3.291		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.494	Shapiro Wilk Test Statistic	0.649
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0674	95% H-UCL	0.067
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0772
95% Adjusted-CLT UCL (Chen-1995)	0.0711	97.5% Chebyshev (MVUE) UCL	0.0856
95% Modified-t UCL (Johnson-1978)	0.0681	99% Chebyshev (MVUE) UCL	0.102
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	6.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00865		
MLE of Mean	0.058		
MLE of Standard Deviation	0.0224		
nu star	294.8		
Approximate Chi Square Value (.05)	256	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	0.067
Adjusted Chi Square Value	253.3	95% Jackknife UCL	0.0674
		95% Standard Bootstrap UCL	0.0669
Anderson-Darling Test Statistic	3.991	95% Bootstrap-t UCL	0.0731
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	0.109
Kolmogorov-Smirnov Test Statistic	0.407	95% Percentile Bootstrap UCL	0.0674
Kolmogorov-Smirnov 5% Critical Value	0.186	95% BCA Bootstrap UCL	0.0714
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0819
		97.5% Chebyshev(Mean, Sd) UCL	0.0923
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.113
95% Approximate Gamma UCL	0.0668		
95% Adjusted Gamma UCL	0.0675		
Potential UCL to Use		Use 95% Student's-t UCL	0.0674
		or 95% Modified-t UCL	0.0681

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	22	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.684	Minimum of Log Data	-0.38
Maximum	3.04	Maximum of Log Data	1.112
Mean	1.361	Mean of log Data	0.274
Median	1.361	SD of log Data	0.258
SD	0.418		
Coefficient of Variation	0.307		
Skewness	3.066		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.505	Shapiro Wilk Test Statistic	0.618
Shapiro Wilk Critical Value	0.911	Shapiro Wilk Critical Value	0.911
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.514	95% H-UCL	1.505
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.686
95% Adjusted-CLT UCL (Chen-1995)	1.569	97.5% Chebyshev (MVUE) UCL	1.828
95% Modified-t UCL (Johnson-1978)	1.524	99% Chebyshev (MVUE) UCL	2.107
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	12.78	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.106		
MLE of Mean	1.361		
MLE of Standard Deviation	0.381		
nu star	562.5		
Approximate Chi Square Value (.05)	508.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0386	95% CLT UCL	1.507
Adjusted Chi Square Value	504.6	95% Jackknife UCL	1.514
		95% Standard Bootstrap UCL	1.501
Anderson-Darling Test Statistic	4.217	95% Bootstrap-t UCL	1.595
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	2.222
Kolmogorov-Smirnov Test Statistic	0.42	95% Percentile Bootstrap UCL	1.513
Kolmogorov-Smirnov 5% Critical Value	0.185	95% BCA Bootstrap UCL	1.576
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.749
		97.5% Chebyshev(Mean, Sd) UCL	1.917
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.247
95% Approximate Gamma UCL	1.505		
95% Adjusted Gamma UCL	1.517		
Potential UCL to Use		Use 95% Student's-t UCL	1.514
		or 95% Modified-t UCL	1.524

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	520-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	4810	Minimum of Log Data	8.478
Maximum	12100	Maximum of Log Data	9.401
Mean	8920	Mean of log Data	9.081
Median	8920	SD of log Data	0.192
SD	1460		
Coefficient of Variation	0.164		
Skewness	-1.057		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.557
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9611	95% H-UCL	9856
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10945
95% Adjusted-CLT UCL (Chen-1995)	9444	97.5% Chebyshev (MVUE) UCL	11814
95% Modified-t UCL (Johnson-1978)	9593	99% Chebyshev (MVUE) UCL	13521
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	26.04	Data do not follow a Discernable Distribution (0.05)	
Theta Star	342.5		
MLE of Mean	8920		
MLE of Standard Deviation	1748		
nu star	729.2		
Approximate Chi Square Value (.05)	667.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	9562
Adjusted Chi Square Value	659.7	95% Jackknife UCL	9611
		95% Standard Bootstrap UCL	9534
Anderson-Darling Test Statistic	2.974	95% Bootstrap-t UCL	9487
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	9557
Kolmogorov-Smirnov Test Statistic	0.452	95% Percentile Bootstrap UCL	9501
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	9434
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10621
		97.5% Chebyshev(Mean, Sd) UCL	11357
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	12803
95% Approximate Gamma UCL	9744		
95% Adjusted Gamma UCL	9860		
Potential UCL to Use		Use 95% Student's-t UCL	9611
		or 95% Modified-t UCL	9593

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	5	Minimum of Log Data	1.609
Maximum	11	Maximum of Log Data	2.398
Mean	8.491	Mean of log Data	2.118
Median	8.491	SD of log Data	0.22
SD	1.751		
Coefficient of Variation	0.206		
Skewness	-0.17		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.898
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.32	95% H-UCL	9.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.69
95% Adjusted-CLT UCL (Chen-1995)	9.238	97.5% Chebyshev (MVUE) UCL	11.64
95% Modified-t UCL (Johnson-1978)	9.316	99% Chebyshev (MVUE) UCL	13.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	18.57	Data appear Normal at 5% Significance Level	
Theta Star	0.457		
MLE of Mean	8.491		
MLE of Standard Deviation	1.97		
nu star	520		
Approximate Chi Square Value (.05)	468.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	9.261
Adjusted Chi Square Value	461.6	95% Jackknife UCL	9.32
		95% Standard Bootstrap UCL	9.231
Anderson-Darling Test Statistic	0.623	95% Bootstrap-t UCL	9.302
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	9.286
Kolmogorov-Smirnov Test Statistic	0.242	95% Percentile Bootstrap UCL	9.211
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	9.149
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.53
		97.5% Chebyshev(Mean, Sd) UCL	11.41
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.15
95% Approximate Gamma UCL	9.432		
95% Adjusted Gamma UCL	9.566		

Potential UCL to Use		Use 95% Student's-t UCL	9.32

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	79	Minimum of Log Data	4.369
Maximum	258	Maximum of Log Data	5.553
Mean	138.7	Mean of log Data	4.901
Median	138.7	SD of log Data	0.252
SD	39.02		
Coefficient of Variation	0.281		
Skewness	2.139		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.635	Shapiro Wilk Test Statistic	0.72
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	157.1	95% H-UCL	158
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	179.4
95% Adjusted-CLT UCL (Chen-1995)	162.2	97.5% Chebyshev (MVUE) UCL	197.2
95% Modified-t UCL (Johnson-1978)	158.1	99% Chebyshev (MVUE) UCL	232.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	12.81	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.82		
MLE of Mean	138.7		
MLE of Standard Deviation	38.73		
nu star	358.8		
Approximate Chi Square Value (.05)	315.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	155.8
Adjusted Chi Square Value	310.6	95% Jackknife UCL	157.1
		95% Standard Bootstrap UCL	155.8
Anderson-Darling Test Statistic	2.178	95% Bootstrap-t UCL	164.5
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	246
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	155.7
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	161.4
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	184.1
		97.5% Chebyshev(Mean, Sd) UCL	203.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	242.4
95% Approximate Gamma UCL	157.5		
95% Adjusted Gamma UCL	160.2		
Potential UCL to Use		Use 95% Student's-t UCL	157.1
		or 95% Modified-t UCL	158.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.4	Minimum of Log Data	-0.916
Maximum	0.7	Maximum of Log Data	-0.357
Mean	0.548	Mean of log Data	-0.608
Median	0.548	SD of log Data	0.115
SD	0.0614		
Coefficient of Variation	0.112		
Skewness	0.119		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.716	Shapiro Wilk Test Statistic	0.706
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.577	95% H-UCL	0.58
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.621
95% Adjusted-CLT UCL (Chen-1995)	0.575	97.5% Chebyshev (MVUE) UCL	0.653
95% Modified-t UCL (Johnson-1978)	0.577	99% Chebyshev (MVUE) UCL	0.715
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	65.52	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00836		
MLE of Mean	0.548		
MLE of Standard Deviation	0.0676		
nu star	1835		
Approximate Chi Square Value (.05)	1736	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.575
Adjusted Chi Square Value	1723	95% Jackknife UCL	0.577
		95% Standard Bootstrap UCL	0.574
Anderson-Darling Test Statistic	2.187	95% Bootstrap-t UCL	0.576
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	0.588
Kolmogorov-Smirnov Test Statistic	0.372	95% Percentile Bootstrap UCL	0.573
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	0.572
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.619
		97.5% Chebyshev(Mean, Sd) UCL	0.65
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.711
95% Approximate Gamma UCL	0.579		
95% Adjusted Gamma UCL	0.583		
Potential UCL to Use		Use 95% Student's-t UCL	0.577
		or 95% Modified-t UCL	0.577

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cesium-137

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics
Minimum	-0.00601	Log Statistics Not Available
Maximum	1.61	
Mean	0.402	
Median	0.402	
SD	0.387	
Coefficient of Variation	0.963	
Skewness	2.428	

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Not Available	
Shapiro Wilk Critical Value	0.874		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.585	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.585	95% Adjusted-CLT UCL (Chen 1995)	0.644
		95% Modified-t UCL (Johnson-1978)	0.596
Gamma Distribution Test		Data Distribution	
Gamma Statistics Not Available		Data do not follow a Discernable Distribution (0.05)	
Potential UCL to Use			
Use 95% Chebyshev (Mean, Sd) UCL	0.853	95% CLT UCL	0.572
		95% Jackknife UCL	0.585
		95% Standard Bootstrap UCL	0.572
		95% Bootstrap-t UCL	0.68
		95% Hall's Bootstrap UCL	1.378
		95% Percentile Bootstrap UCL	0.575
		95% BCA Bootstrap UCL	0.632
		95% Chebyshev(Mean, Sd) UCL	0.853
		97.5% Chebyshev(Mean, Sd) UCL	1.048
		99% Chebyshev(Mean, Sd) UCL	1.431

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	6.8	Minimum of Log Data	1.917
Maximum	85	Maximum of Log Data	4.443
Mean	47.15	Mean of log Data	3.645
Median	47.15	SD of log Data	0.759
SD	26.13		
Coefficient of Variation	0.554		
Skewness	0.142		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.913	Shapiro Wilk Test Statistic	0.865
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	59.52	95% H-UCL	84.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.36
95% Adjusted-CLT UCL (Chen-1995)	58.92	97.5% Chebyshev (MVUE) UCL	116.5
95% Modified-t UCL (Johnson-1978)	59.56	99% Chebyshev (MVUE) UCL	156.1

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.058	Data appear Normal at 5% Significance Level	
Theta Star	22.92		
MLE of Mean	47.15		
MLE of Standard Deviation	32.87		
nu star	57.61		
Approximate Chi Square Value (.05)	41.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	58.64
Adjusted Chi Square Value	39.32	95% Jackknife UCL	59.52
		95% Standard Bootstrap UCL	58.02
Anderson-Darling Test Statistic	0.601	95% Bootstrap-t UCL	59.78
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	59.21
Kolmogorov-Smirnov Test Statistic	0.201	95% Percentile Bootstrap UCL	58.18
Kolmogorov-Smirnov 5% Critical Value	0.231	95% BCA Bootstrap UCL	58.27
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	77.59
		97.5% Chebyshev(Mean, Sd) UCL	90.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	116.6
95% Approximate Gamma UCL	65.99		
95% Adjusted Gamma UCL	69.08		

Potential UCL to Use		Use 95% Student's-t UCL	59.52

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	4.6	Minimum of Log Data	1.526
Maximum	17.9	Maximum of Log Data	2.885
Mean	9.453	Mean of log Data	2.21
Median	9.453	SD of log Data	0.277
SD	2.793		
Coefficient of Variation	0.295		
Skewness	1.965		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.636	Shapiro Wilk Test Statistic	0.701
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.77	95% H-UCL	10.94
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.53
95% Adjusted-CLT UCL (Chen-1995)	11.1	97.5% Chebyshev (MVUE) UCL	13.86
95% Modified-t UCL (Johnson-1978)	10.84	99% Chebyshev (MVUE) UCL	16.47
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.1	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.852		
MLE of Mean	9.453		
MLE of Standard Deviation	2.838		
nu star	310.7		
Approximate Chi Square Value (.05)	270.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	10.68
Adjusted Chi Square Value	265.9	95% Jackknife UCL	10.77
		95% Standard Bootstrap UCL	10.62
Anderson-Darling Test Statistic	2.252	95% Bootstrap-t UCL	11.16
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	17.53
Kolmogorov-Smirnov Test Statistic	0.393	95% Percentile Bootstrap UCL	10.78
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	11.02
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.71
		97.5% Chebyshev(Mean, Sd) UCL	14.11
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.88
95% Approximate Gamma UCL	10.84		
95% Adjusted Gamma UCL	11.04		
Potential UCL to Use		Use 95% Student's-t UCL	10.77
		or 95% Modified-t UCL	10.84

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	11

Raw Statistics		Log-transformed Statistics	
Minimum	7901	Minimum of Log Data	8.975
Maximum	32605	Maximum of Log Data	10.39
Mean	14151	Mean of log Data	9.495
Median	14151	SD of log Data	0.347
SD	5980		
Coefficient of Variation	0.423		
Skewness	2.413		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.74	Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16981	95% H-UCL	17012
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19822
95% Adjusted-CLT UCL (Chen-1995)	17881	97.5% Chebyshev (MVUE) UCL	22316
95% Modified-t UCL (Johnson-1978)	17153	99% Chebyshev (MVUE) UCL	27215
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.484	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2182		
MLE of Mean	14151		
MLE of Standard Deviation	5557		
nu star	181.6		
Approximate Chi Square Value (.05)	151.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	16780
Adjusted Chi Square Value	147.7	95% Jackknife UCL	16981
		95% Standard Bootstrap UCL	16693
Anderson-Darling Test Statistic	0.688	95% Bootstrap-t UCL	18885
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	29134
Kolmogorov-Smirnov Test Statistic	0.196	95% Percentile Bootstrap UCL	16949
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	18052
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21117
		97.5% Chebyshev(Mean, Sd) UCL	24132
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30053
95% Approximate Gamma UCL	16971		
95% Adjusted Gamma UCL	17390		
Potential UCL to Use		Use 95% Approximate Gamma UCL	16971

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	199.6	Minimum of Log Data	5.296
Maximum	1550	Maximum of Log Data	7.346
Mean	547.7	Mean of log Data	6.152
Median	546.9	SD of log Data	0.553
SD	356.5		
Coefficient of Variation	0.651		
Skewness	1.973		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	716.5	95% H-UCL	754.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	900.7
95% Adjusted-CLT UCL (Chen-1995)	758.1	97.5% Chebyshev (MVUE) UCL	1056
95% Modified-t UCL (Johnson-1978)	724.8	99% Chebyshev (MVUE) UCL	1362
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.73	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	200.6		
MLE of Mean	547.7		
MLE of Standard Deviation	331.5		
nu star	76.45		
Approximate Chi Square Value (.05)	57.31	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	704.5
Adjusted Chi Square Value	55.11	95% Jackknife UCL	716.5
		95% Standard Bootstrap UCL	699.7
Anderson-Darling Test Statistic	0.664	95% Bootstrap-t UCL	868.9
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	1597
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	714.4
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	757.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	963.1
		97.5% Chebyshev(Mean, Sd) UCL	1143
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1496
95% Approximate Gamma UCL	730.7		
95% Adjusted Gamma UCL	759.8		
Potential UCL to Use		Use 95% Approximate Gamma UCL	730.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0201	Minimum of Log Data	-3.907
Maximum	10.68	Maximum of Log Data	2.368
Mean	7.033	Mean of log Data	0.984
Median	8.281	SD of log Data	2.388
SD	4.022		
Coefficient of Variation	0.572		
Skewness	-1.147		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.746	Shapiro Wilk Test Statistic	0.59
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.936	95% H-UCL	1731
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	109.6
95% Adjusted-CLT UCL (Chen-1995)	8.449	97.5% Chebyshev (MVUE) UCL	145.4
95% Modified-t UCL (Johnson-1978)	8.881	99% Chebyshev (MVUE) UCL	215.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.546	Data do not follow a Discernable Distribution (0.05)	
Theta Star	12.89		
MLE of Mean	7.033		
MLE of Standard Deviation	9.52		
nu star	15.28		
Approximate Chi Square Value (.05)	7.456	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	8.801
Adjusted Chi Square Value	6.742	95% Jackknife UCL	8.936
		95% Standard Bootstrap UCL	8.717
Anderson-Darling Test Statistic	2.928	95% Bootstrap-t UCL	8.574
Anderson-Darling 5% Critical Value	0.781	95% Hall's Bootstrap UCL	8.455
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	8.655
Kolmogorov-Smirnov 5% Critical Value	0.239	95% BCA Bootstrap UCL	8.458
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.72
		97.5% Chebyshev(Mean, Sd) UCL	13.75
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.73
95% Approximate Gamma UCL	14.41		
95% Adjusted Gamma UCL	15.94		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) UCL	17.73

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	-0.00794	Log Statistics Not Available	
Maximum	1.1		
Mean	0.219		
Median	0.219		
SD	0.273		
Coefficient of Variation	1.247		
Skewness	2.821		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.576	Not Available	
Shapiro Wilk Critical Value	0.874		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.348	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.348	95% Adjusted-CLT UCL (Chen 1995)	0.398
		95% Modified-t UCL (Johnson-1978)	0.358
Gamma Distribution Test		Data Distribution	
Gamma Statistics Not Available		Data do not follow a Discernable Distribution (0.05)	
Potential UCL to Use			
Use 95% Chebyshev (Mean, Sd) UCL	0.537	95% CLT UCL	0.339
		95% Jackknife UCL	0.348
		95% Standard Bootstrap UCL	0.33
		95% Bootstrap-t UCL	0.447
		95% Hall's Bootstrap UCL	0.855
		95% Percentile Bootstrap UCL	0.345
		95% BCA Bootstrap UCL	0.392
		95% Chebyshev(Mean, Sd) UCL	0.537
		97.5% Chebyshev(Mean, Sd) UCL	0.675
		99% Chebyshev(Mean, Sd) UCL	0.946

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	11.2	Minimum of Log Data	2.416
Maximum	648	Maximum of Log Data	6.474
Mean	168.5	Mean of log Data	4.806
Median	141.8	SD of log Data	0.907
SD	152.9		
Coefficient of Variation	0.907		
Skewness	2.607		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.71	Shapiro Wilk Test Statistic	0.895
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	240.9	95% H-UCL	358.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	379
95% Adjusted-CLT UCL (Chen-1995)	266.1	97.5% Chebyshev (MVUE) UCL	466.3
95% Modified-t UCL (Johnson-1978)	245.6	99% Chebyshev (MVUE) UCL	637.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.386	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	121.6		
MLE of Mean	168.5		
MLE of Standard Deviation	143.1		
nu star	38.81		
Approximate Chi Square Value (.05)	25.54	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	235.7
Adjusted Chi Square Value	24.12	95% Jackknife UCL	240.9
		95% Standard Bootstrap UCL	236
Anderson-Darling Test Statistic	0.515	95% Bootstrap-t UCL	316.4
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	529.9
Kolmogorov-Smirnov Test Statistic	0.184	95% Percentile Bootstrap UCL	239.2
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	270.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	346.6
		97.5% Chebyshev(Mean, Sd) UCL	423.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	575.1
95% Approximate Gamma UCL	256		
95% Adjusted Gamma UCL	271.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	256

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.044	Minimum of Log Data	-3.124
Maximum	13.95	Maximum of Log Data	2.635
Mean	7.929	Mean of log Data	1.429
Median	8.964	SD of log Data	1.944
SD	4.005		
Coefficient of Variation	0.505		
Skewness	-1.036		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.852	Shapiro Wilk Test Statistic	0.545
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.824	95% H-UCL	323.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	73.11
95% Adjusted-CLT UCL (Chen-1995)	9.373	97.5% Chebyshev (MVUE) UCL	95.86
95% Modified-t UCL (Johnson-1978)	9.775	99% Chebyshev (MVUE) UCL	140.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.763	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.39		
MLE of Mean	7.929		
MLE of Standard Deviation	9.077		
nu star	21.37		
Approximate Chi Square Value (.05)	11.87	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	9.689
Adjusted Chi Square Value	10.93	95% Jackknife UCL	9.824
		95% Standard Bootstrap UCL	9.637
Anderson-Darling Test Statistic	2.711	95% Bootstrap-t UCL	9.48
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	9.457
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	9.53
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	9.263
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.59
		97.5% Chebyshev(Mean, Sd) UCL	14.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	18.58
95% Approximate Gamma UCL	14.28		
95% Adjusted Gamma UCL	15.49		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	18.58
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.201	Minimum of Log Data	-1.604
Maximum	18.7	Maximum of Log Data	2.929
Mean	5.155	Mean of log Data	1.24
Median	5.155	SD of log Data	1.133
SD	4.341		
Coefficient of Variation	0.842		
Skewness	2.418		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.609	Shapiro Wilk Test Statistic	0.714
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	7.209	95% H-UCL	16.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.05
95% Adjusted-CLT UCL (Chen-1995)	7.864	97.5% Chebyshev (MVUE) UCL	18.9
95% Modified-t UCL (Johnson-1978)	7.334	99% Chebyshev (MVUE) UCL	26.48
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.143	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.51		
MLE of Mean	5.155		
MLE of Standard Deviation	4.822		
nu star	32		
Approximate Chi Square Value (.05)	20.07	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	7.063
Adjusted Chi Square Value	18.83	95% Jackknife UCL	7.209
		95% Standard Bootstrap UCL	6.976
Anderson-Darling Test Statistic	2.064	95% Bootstrap-t UCL	8.26
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	16.14
Kolmogorov-Smirnov Test Statistic	0.398	95% Percentile Bootstrap UCL	7.35
Kolmogorov-Smirnov 5% Critical Value	0.233	95% BCA Bootstrap UCL	7.736
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.21
		97.5% Chebyshev(Mean, Sd) UCL	12.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.7
95% Approximate Gamma UCL	8.218		
95% Adjusted Gamma UCL	8.762		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	10.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0078	Minimum of Log Data	-4.854
Maximum	0.49	Maximum of Log Data	-0.713
Mean	0.247	Mean of log Data	-1.697
Median	0.247	SD of log Data	1.1
SD	0.126		
Coefficient of Variation	0.511		
Skewness	0.00488		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.751	Shapiro Wilk Test Statistic	0.595
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.307	95% H-UCL	0.829
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.759
95% Adjusted-CLT UCL (Chen-1995)	0.303	97.5% Chebyshev (MVUE) UCL	0.95
95% Modified-t UCL (Johnson-1978)	0.307	99% Chebyshev (MVUE) UCL	1.327
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.473	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.168		
MLE of Mean	0.247		
MLE of Standard Deviation	0.204		
nu star	41.24		
Approximate Chi Square Value (.05)	27.52	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.303
Adjusted Chi Square Value	26.04	95% Jackknife UCL	0.307
		95% Standard Bootstrap UCL	0.301
Anderson-Darling Test Statistic	2.507	95% Bootstrap-t UCL	0.309
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.317
Kolmogorov-Smirnov Test Statistic	0.456	95% Percentile Bootstrap UCL	0.297
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	0.297
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.395
		97.5% Chebyshev(Mean, Sd) UCL	0.458
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.584
95% Approximate Gamma UCL	0.371		
95% Adjusted Gamma UCL	0.392		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.395

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.475	Minimum of Log Data	-0.744
Maximum	22.94	Maximum of Log Data	3.133
Mean	14.28	Mean of log Data	2.387
Median	14.28	SD of log Data	1.04
SD	6.792		
Coefficient of Variation	0.476		
Skewness	-0.836		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.899	Shapiro Wilk Test Statistic	0.669
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	17.49	95% H-UCL	42.65
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.1
95% Adjusted-CLT UCL (Chen-1995)	16.83	97.5% Chebyshev (MVUE) UCL	51.22
95% Modified-t UCL (Johnson-1978)	17.43	99% Chebyshev (MVUE) UCL	71.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.612	Data appear Normal at 5% Significance Level	
Theta Star	8.858		
MLE of Mean	14.28		
MLE of Standard Deviation	11.25		
nu star	45.14		
Approximate Chi Square Value (.05)	30.72	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	17.26
Adjusted Chi Square Value	29.15	95% Jackknife UCL	17.49
		95% Standard Bootstrap UCL	17.14
Anderson-Darling Test Statistic	1.356	95% Bootstrap-t UCL	16.96
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	16.77
Kolmogorov-Smirnov Test Statistic	0.308	95% Percentile Bootstrap UCL	17.01
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	16.91
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.19
		97.5% Chebyshev(Mean, Sd) UCL	25.61
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	32.34
95% Approximate Gamma UCL	20.98		
95% Adjusted Gamma UCL	22.11		

Potential UCL to Use			
		Use 95% Student's-t UCL	17.49

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.00141	Minimum of Log Data	-6.564
Maximum	0.19	Maximum of Log Data	-1.661
Mean	0.0766	Mean of log Data	-2.831
Median	0.0766	SD of log Data	1.11
SD	0.0385		
Coefficient of Variation	0.503		
Skewness	1.593		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.633	Shapiro Wilk Test Statistic	0.473
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0948	95% H-UCL	0.273
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.248
95% Adjusted-CLT UCL (Chen-1995)	0.0982	97.5% Chebyshev (MVUE) UCL	0.31
95% Modified-t UCL (Johnson-1978)	0.0956	99% Chebyshev (MVUE) UCL	0.434
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.665	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.046		
MLE of Mean	0.0766		
MLE of Standard Deviation	0.0594		
nu star	46.63		
Approximate Chi Square Value (.05)	31.96	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.0935
Adjusted Chi Square Value	30.35	95% Jackknife UCL	0.0948
		95% Standard Bootstrap UCL	0.0927
Anderson-Darling Test Statistic	2.958	95% Bootstrap-t UCL	0.0988
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.2
Kolmogorov-Smirnov Test Statistic	0.378	95% Percentile Bootstrap UCL	0.0928
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	0.0982
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.121
		97.5% Chebyshev(Mean, Sd) UCL	0.141
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.179
95% Approximate Gamma UCL	0.112		
95% Adjusted Gamma UCL	0.118		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.121

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.159	Minimum of Log Data	-1.839
Maximum	6.14	Maximum of Log Data	1.815
Mean	2.185	Mean of log Data	0.584
Median	2.185	SD of log Data	0.79
SD	1.291		
Coefficient of Variation	0.591		
Skewness	2.156		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.636	Shapiro Wilk Test Statistic	0.635
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.796	95% H-UCL	4.203
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.71
95% Adjusted-CLT UCL (Chen-1995)	2.964	97.5% Chebyshev (MVUE) UCL	5.717
95% Modified-t UCL (Johnson-1978)	2.829	99% Chebyshev (MVUE) UCL	7.695
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.157	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.013		
MLE of Mean	2.185		
MLE of Standard Deviation	1.488		
nu star	60.39		
Approximate Chi Square Value (.05)	43.52	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	2.752
Adjusted Chi Square Value	41.62	95% Jackknife UCL	2.796
		95% Standard Bootstrap UCL	2.731
Anderson-Darling Test Statistic	2.201	95% Bootstrap-t UCL	3.031
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	5.725
Kolmogorov-Smirnov Test Statistic	0.367	95% Percentile Bootstrap UCL	2.757
Kolmogorov-Smirnov 5% Critical Value	0.231	95% BCA Bootstrap UCL	2.953
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.688
		97.5% Chebyshev(Mean, Sd) UCL	4.339
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.617
95% Approximate Gamma UCL	3.032		
95% Adjusted Gamma UCL	3.17		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	3.688

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	520-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	6.38	Minimum of Log Data	1.853
Maximum	11	Maximum of Log Data	2.398
Mean	9.151	Mean of log Data	2.199
Median	9.151	SD of log Data	0.179
SD	1.581		
Coefficient of Variation	0.173		
Skewness	-0.226		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.913	Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.87	95% H-UCL	9.988
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.01
95% Adjusted-CLT UCL (Chen-1995)	9.797	97.5% Chebyshev (MVUE) UCL	11.81
95% Modified-t UCL (Johnson-1978)	9.866	99% Chebyshev (MVUE) UCL	13.39
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	27.51	Data appear Normal at 5% Significance Level	
Theta Star	0.333		
MLE of Mean	9.151		
MLE of Standard Deviation	1.745		
nu star	825.2		
Approximate Chi Square Value (.05)	759.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9.822
Adjusted Chi Square Value	751.7	95% Jackknife UCL	9.87
		95% Standard Bootstrap UCL	9.803
Anderson-Darling Test Statistic	0.485	95% Bootstrap-t UCL	9.834
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	9.767
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	9.779
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9.772
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.93
		97.5% Chebyshev(Mean, Sd) UCL	11.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.21
95% Approximate Gamma UCL	9.942		
95% Adjusted Gamma UCL	10.04		
Potential UCL to Use		Use 95% Student's-t UCL	9.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	11	Minimum of Log Data	2.398
Maximum	85	Maximum of Log Data	4.443
Mean	52	Mean of log Data	3.785
Median	40.33	SD of log Data	0.648
SD	27.39		
Coefficient of Variation	0.527		
Skewness	0.119		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.868
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	64.46	95% H-UCL	80.08
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	94.28
95% Adjusted-CLT UCL (Chen-1995)	63.86	97.5% Chebyshev (MVUE) UCL	112
95% Modified-t UCL (Johnson-1978)	64.49	99% Chebyshev (MVUE) UCL	146.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.57	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	20.23		
MLE of Mean	52		
MLE of Standard Deviation	32.44		
nu star	77.1		
Approximate Chi Square Value (.05)	57.87	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	63.63
Adjusted Chi Square Value	55.82	95% Jackknife UCL	64.46
		95% Standard Bootstrap UCL	63.17
Anderson-Darling Test Statistic	0.724	95% Bootstrap-t UCL	63.96
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	62.52
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	63.06
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	62.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	82.83
		97.5% Chebyshev(Mean, Sd) UCL	96.17
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	122.4
95% Approximate Gamma UCL	69.27		
95% Adjusted Gamma UCL	71.81		
Potential UCL to Use		Use 95% Approximate Gamma UCL	69.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15
Raw Statistics		Log-transformed Statistics	
Minimum	228.7	Minimum of Log Data	5.432
Maximum	1762	Maximum of Log Data	7.474
Mean	496.3	Mean of log Data	6.062
Median	431.7	SD of log Data	0.496
SD	369.9		
Coefficient of Variation	0.745		
Skewness	3.2		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.593	Shapiro Wilk Test Statistic	0.87
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	664.5	95% H-UCL	637.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	757.3
95% Adjusted-CLT UCL (Chen-1995)	737.8	97.5% Chebyshev (MVUE) UCL	876.9
95% Modified-t UCL (Johnson-1978)	677.7	99% Chebyshev (MVUE) UCL	1112
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.919	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	170		
MLE of Mean	496.3		
MLE of Standard Deviation	290.5		
nu star	87.57		
Approximate Chi Square Value (.05)	66.99	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	653.4
Adjusted Chi Square Value	64.78	95% Jackknife UCL	664.5
		95% Standard Bootstrap UCL	649.3
Anderson-Darling Test Statistic	0.982	95% Bootstrap-t UCL	885.6
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	1294
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	668.1
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	763.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	912.6
		97.5% Chebyshev(Mean, Sd) UCL	1093
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1447
95% Approximate Gamma UCL	648.7		
95% Adjusted Gamma UCL	670.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	648.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	11.88	Maximum of Log Data	2.475
Mean	8.723	Mean of log Data	1.689
Median	10	SD of log Data	1.648
SD	3.543		
Coefficient of Variation	0.406		
Skewness	-2.256		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.454
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.33	95% H-UCL	116.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	55.29
95% Adjusted-CLT UCL (Chen-1995)	9.659	97.5% Chebyshev (MVUE) UCL	71.57
95% Modified-t UCL (Johnson-1978)	10.25	99% Chebyshev (MVUE) UCL	103.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.995	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.768		
MLE of Mean	8.723		
MLE of Standard Deviation	8.746		
nu star	29.85		
Approximate Chi Square Value (.05)	18.37	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.23
Adjusted Chi Square Value	17.27	95% Jackknife UCL	10.33
		95% Standard Bootstrap UCL	10.19
Anderson-Darling Test Statistic	4.381	95% Bootstrap-t UCL	9.943
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	9.739
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	10.04
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	9.915
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.71
		97.5% Chebyshev(Mean, Sd) UCL	14.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.83
95% Approximate Gamma UCL	14.17		
95% Adjusted Gamma UCL	15.08		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.83
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	4
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	0.11	Maximum of Log Data	-2.207
Mean	0.05	Mean of log Data	-3.07
Median	0.05	SD of log Data	0.42
SD	0.0197		
Coefficient of Variation	0.395		
Skewness	1.69		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.638
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.059	95% H-UCL	0.0634
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0747
95% Adjusted-CLT UCL (Chen-1995)	0.0608	97.5% Chebyshev (MVUE) UCL	0.0853
95% Modified-t UCL (Johnson-1978)	0.0593	99% Chebyshev (MVUE) UCL	0.106
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.586	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00895		
MLE of Mean	0.05		
MLE of Standard Deviation	0.0212		
nu star	167.6		
Approximate Chi Square Value (.05)	138.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.0584
Adjusted Chi Square Value	135.4	95% Jackknife UCL	0.059
		95% Standard Bootstrap UCL	0.0579
Anderson-Darling Test Statistic	2.966	95% Bootstrap-t UCL	0.0613
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.108
Kolmogorov-Smirnov Test Statistic	0.417	95% Percentile Bootstrap UCL	0.058
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.0603
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0722
		97.5% Chebyshev(Mean, Sd) UCL	0.0818
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.101
95% Approximate Gamma UCL	0.0604		
95% Adjusted Gamma UCL	0.0619		
Potential UCL to Use		Use 95% Student's-t UCL	0.059
		or 95% Modified-t UCL	0.0593

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15
Raw Statistics		**Log-transformed Statistics**	
Minimum	43.2	Minimum of Log Data	3.766
Maximum	809.8	Maximum of Log Data	6.697
Mean	206.3	Mean of log Data	4.992
Median	142.4	SD of log Data	0.821
SD	201.7		
Coefficient of Variation	0.978		
Skewness	2.215		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.746	Shapiro Wilk Test Statistic	0.973
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	298	95% H-UCL	355.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	398.9
95% Adjusted-CLT UCL (Chen-1995)	323.8	97.5% Chebyshev (MVUE) UCL	484.7
95% Modified-t UCL (Johnson-1978)	303	99% Chebyshev (MVUE) UCL	653.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.349	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	152.9		
MLE of Mean	206.3		
MLE of Standard Deviation	177.6		
nu star	40.47		
Approximate Chi Square Value (.05)	26.89	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	292
Adjusted Chi Square Value	25.54	95% Jackknife UCL	298
		95% Standard Bootstrap UCL	289.7
Anderson-Darling Test Statistic	0.405	95% Bootstrap-t UCL	388
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	665.7
Kolmogorov-Smirnov Test Statistic	0.149	95% Percentile Bootstrap UCL	294.5
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	328.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	433.3
		97.5% Chebyshev(Mean, Sd) UCL	531.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	724.6
95% Approximate Gamma UCL	310.4		
95% Adjusted Gamma UCL	327		
Potential UCL to Use		Use 95% Approximate Gamma UCL	310.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.0638	Minimum of Log Data	-2.752
Maximum	0.497	Maximum of Log Data	-0.7
Mean	0.21	Mean of log Data	-1.657
Median	0.21	SD of log Data	0.482
SD	0.0939		
Coefficient of Variation	0.447		
Skewness	1.762		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.588	Shapiro Wilk Test Statistic	0.623
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.253	95% H-UCL	0.279
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.331
95% Adjusted-CLT UCL (Chen-1995)	0.262	97.5% Chebyshev (MVUE) UCL	0.382
95% Modified-t UCL (Johnson-1978)	0.254	99% Chebyshev (MVUE) UCL	0.483
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.342	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0483		
MLE of Mean	0.21		
MLE of Standard Deviation	0.101		
nu star	130.3		
Approximate Chi Square Value (.05)	104.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.25
Adjusted Chi Square Value	102.1	95% Jackknife UCL	0.253
		95% Standard Bootstrap UCL	0.25
Anderson-Darling Test Statistic	3.068	95% Bootstrap-t UCL	0.265
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	0.481
Kolmogorov-Smirnov Test Statistic	0.424	95% Percentile Bootstrap UCL	0.248
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.267
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.316
		97.5% Chebyshev(Mean, Sd) UCL	0.361
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.451
95% Approximate Gamma UCL	0.261		
95% Adjusted Gamma UCL	0.268		
Potential UCL to Use		Use 95% Student's-t UCL	0.253
		or 95% Modified-t UCL	0.254

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	8.45	Minimum of Log Data	2.134
Maximum	114	Maximum of Log Data	4.736
Mean	26.7	Mean of log Data	3
Median	20	SD of log Data	0.701
SD	27.3		
Coefficient of Variation	1.022		
Skewness	2.756		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.881
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	39.12	95% H-UCL	39.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.12
95% Adjusted-CLT UCL (Chen-1995)	43.65	97.5% Chebyshev (MVUE) UCL	55.18
95% Modified-t UCL (Johnson-1978)	39.95	99% Chebyshev (MVUE) UCL	72.97
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.57	Data appear Lognormal at 5% Significance Level	
Theta Star	17.01		
MLE of Mean	26.7		
MLE of Standard Deviation	21.31		
nu star	47.09		
Approximate Chi Square Value (.05)	32.34	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	38.29
Adjusted Chi Square Value	30.84	95% Jackknife UCL	39.12
		95% Standard Bootstrap UCL	37.92
Anderson-Darling Test Statistic	1.173	95% Bootstrap-t UCL	69.27
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	100.2
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL	38.96
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	43.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	57.42
		97.5% Chebyshev(Mean, Sd) UCL	70.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	96.83
95% Approximate Gamma UCL	38.88		
95% Adjusted Gamma UCL	40.77		
Potential UCL to Use		Use 95% H-UCL	39.56

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	1.01	Minimum of Log Data	0.00995
Maximum	2.06	Maximum of Log Data	0.723
Mean	1.483	Mean of log Data	0.386
Median	1.483	SD of log Data	0.136
SD	0.201		
Coefficient of Variation	0.136		
Skewness	0.855		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.583	Shapiro Wilk Test Statistic	0.589
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.575	95% H-UCL	1.583
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.711
95% Adjusted-CLT UCL (Chen-1995)	1.581	97.5% Chebyshev (MVUE) UCL	1.81
95% Modified-t UCL (Johnson-1978)	1.577	99% Chebyshev (MVUE) UCL	2.004

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	47	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0316		
MLE of Mean	1.483		
MLE of Standard Deviation	0.216		
nu star	1410		
Approximate Chi Square Value (.05)	1324	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	1.569
Adjusted Chi Square Value	1314	95% Jackknife UCL	1.575
		95% Standard Bootstrap UCL	1.568
Anderson-Darling Test Statistic	3.265	95% Bootstrap-t UCL	1.579
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	1.66
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	1.567
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	1.567
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.71
		97.5% Chebyshev(Mean, Sd) UCL	1.808
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2
95% Approximate Gamma UCL	1.58		
95% Adjusted Gamma UCL	1.592		

Potential UCL to Use		
	Use 95% Student's-t UCL	1.575
	or 95% Modified-t UCL	1.577

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	520-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	8

Raw Statistics		Log-transformed Statistics	
Minimum	5.2	Minimum of Log Data	1.649
Maximum	11.06	Maximum of Log Data	2.403
Mean	9.514	Mean of log Data	2.227
Median	11	SD of log Data	0.245
SD	2.044		
Coefficient of Variation	0.215		
Skewness	-0.941		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.751	Shapiro Wilk Test Statistic	0.748
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.44	95% H-UCL	10.78
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.18
95% Adjusted-CLT UCL (Chen-1995)	10.24	97.5% Chebyshev (MVUE) UCL	13.33
95% Modified-t UCL (Johnson-1978)	10.42	99% Chebyshev (MVUE) UCL	15.57

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	15.83	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.601		
MLE of Mean	9.514		
MLE of Standard Deviation	2.392		
nu star	474.8		
Approximate Chi Square Value (.05)	425.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.38
Adjusted Chi Square Value	419.5	95% Jackknife UCL	10.44
		95% Standard Bootstrap UCL	10.37
Anderson-Darling Test Statistic	1.762	95% Bootstrap-t UCL	10.38
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	10.23
Kolmogorov-Smirnov Test Statistic	0.369	95% Percentile Bootstrap UCL	10.3
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	10.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.81
		97.5% Chebyshev(Mean, Sd) UCL	12.81
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.76
95% Approximate Gamma UCL	10.62		
95% Adjusted Gamma UCL	10.77		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.44
	or 95% Modified-t UCL	10.42

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	9.7	Minimum of Log Data	2.272
Maximum	85	Maximum of Log Data	4.443
Mean	57.82	Mean of log Data	3.903
Median	64.67	SD of log Data	0.652
SD	27		
Coefficient of Variation	0.467		
Skewness	-0.379		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.86	Shapiro Wilk Test Statistic	0.818
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	70.1	95% H-UCL	90.66
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	106.7
95% Adjusted-CLT UCL (Chen-1995)	68.56	97.5% Chebyshev (MVUE) UCL	126.7
95% Modified-t UCL (Johnson-1978)	69.99	99% Chebyshev (MVUE) UCL	166.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.764	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.92		
MLE of Mean	57.82		
MLE of Standard Deviation	34.78		
nu star	82.93		
Approximate Chi Square Value (.05)	62.94	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	69.29
Adjusted Chi Square Value	60.8	95% Jackknife UCL	70.1
		95% Standard Bootstrap UCL	68.89
Anderson-Darling Test Statistic	0.88	95% Bootstrap-t UCL	69.2
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	68.06
Kolmogorov-Smirnov Test Statistic	0.225	95% Percentile Bootstrap UCL	68.35
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	67.28
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	88.21
		97.5% Chebyshev(Mean, Sd) UCL	101.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	127.2
95% Approximate Gamma UCL	76.18		
95% Adjusted Gamma UCL	78.87		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	88.21
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	7.2	Minimum of Log Data	1.974
Maximum	239.6	Maximum of Log Data	5.479
Mean	50.45	Mean of log Data	3.542
Median	35	SD of log Data	0.827
SD	59.87		
Coefficient of Variation	1.187		
Skewness	2.762		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.55	Shapiro Wilk Test Statistic	0.818
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	77.68	95% H-UCL	84.16
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	94.3
95% Adjusted-CLT UCL (Chen-1995)	87.65	97.5% Chebyshev (MVUE) UCL	114.7
95% Modified-t UCL (Johnson-1978)	79.51	99% Chebyshev (MVUE) UCL	154.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.214	Data do not follow a Discernable Distribution (0.05)	
Theta Star	41.56		
MLE of Mean	50.45		
MLE of Standard Deviation	45.79		
nu star	36.42		
Approximate Chi Square Value (.05)	23.61	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	75.88
Adjusted Chi Square Value	22.34	95% Jackknife UCL	77.68
		95% Standard Bootstrap UCL	75.44
Anderson-Darling Test Statistic	1.987	95% Bootstrap-t UCL	184.5
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	279
Kolmogorov-Smirnov Test Statistic	0.419	95% Percentile Bootstrap UCL	77.73
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	88.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	117.8
		97.5% Chebyshev(Mean, Sd) UCL	147
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	204.2
95% Approximate Gamma UCL	77.83		
95% Adjusted Gamma UCL	82.24		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	117.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0071	Minimum of Log Data	-4.948
Maximum	10	Maximum of Log Data	2.303
Mean	9.11	Mean of log Data	1.792
Median	10	SD of log Data	1.867
SD	2.662		
Coefficient of Variation	0.292		
Skewness	-3.321		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.394	Shapiro Wilk Test Statistic	0.307
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.32	95% H-UCL	294.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	91.33
95% Adjusted-CLT UCL (Chen-1995)	9.611	97.5% Chebyshev (MVUE) UCL	119.3
95% Modified-t UCL (Johnson-1978)	10.22	99% Chebyshev (MVUE) UCL	174.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.117	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.16		
MLE of Mean	9.11		
MLE of Standard Deviation	8.622		
nu star	33.5		
Approximate Chi Square Value (.05)	21.26	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.24
Adjusted Chi Square Value	20.07	95% Jackknife UCL	10.32
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	5.174	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.522	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.11
		97.5% Chebyshev(Mean, Sd) UCL	13.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.95
95% Approximate Gamma UCL	14.35		
95% Adjusted Gamma UCL	15.21		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	15.95

Recommended UCL exceeds the maximum observation
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	7.6	Minimum of Log Data	2.028
Maximum	631	Maximum of Log Data	6.447
Mean	151	Mean of log Data	4.582
Median	65	SD of log Data	1.019
SD	160		
Coefficient of Variation	1.06		
Skewness	2.235		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.712	Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	223.7	95% H-UCL	349.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	352.7
95% Adjusted-CLT UCL (Chen-1995)	244.4	97.5% Chebyshev (MVUE) UCL	437.7
95% Modified-t UCL (Johnson-1978)	227.7	99% Chebyshev (MVUE) UCL	604.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.077	Data appear Lognormal at 5% Significance Level	
Theta Star	140.2		
MLE of Mean	151		
MLE of Standard Deviation	145.5		
nu star	32.3		
Approximate Chi Square Value (.05)	20.31	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	218.9
Adjusted Chi Square Value	19.14	95% Jackknife UCL	223.7
		95% Standard Bootstrap UCL	216.3
Anderson-Darling Test Statistic	0.883	95% Bootstrap-t UCL	292.3
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	454.3
Kolmogorov-Smirnov Test Statistic	0.235	95% Percentile Bootstrap UCL	223.8
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	239.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	331.1
		97.5% Chebyshev(Mean, Sd) UCL	409
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	562.1
95% Approximate Gamma UCL	240.1		
95% Adjusted Gamma UCL	254.7		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	331.1

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.041	Minimum of Log Data	-3.194
Maximum	13.32	Maximum of Log Data	2.589
Mean	9.523	Mean of log Data	1.952
Median	10	SD of log Data	1.426
SD	2.764		
Coefficient of Variation	0.29		
Skewness	-3.109		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.458	Shapiro Wilk Test Statistic	0.315
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.78	95% H-UCL	73.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.83
95% Adjusted-CLT UCL (Chen-1995)	10.08	97.5% Chebyshev (MVUE) UCL	62.47
95% Modified-t UCL (Johnson-1978)	10.68	99% Chebyshev (MVUE) UCL	89.27
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.488	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.399		
MLE of Mean	9.523		
MLE of Standard Deviation	7.806		
nu star	44.64		
Approximate Chi Square Value (.05)	30.32	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.7
Adjusted Chi Square Value	28.87	95% Jackknife UCL	10.78
		95% Standard Bootstrap UCL	10.66
Anderson-Darling Test Statistic	4.967	95% Bootstrap-t UCL	10.37
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	10.24
Kolmogorov-Smirnov Test Statistic	0.537	95% Percentile Bootstrap UCL	10.43
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	10.21
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.63
		97.5% Chebyshev(Mean, Sd) UCL	13.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.62
95% Approximate Gamma UCL	14.02		
95% Adjusted Gamma UCL	14.73		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.63

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.012	Minimum of Log Data	-4.423
Maximum	0.118	Maximum of Log Data	-2.136
Mean	0.065	Mean of log Data	-2.806
Median	0.065	SD of log Data	0.473
SD	0.02		
Coefficient of Variation	0.308		
Skewness	-1.1E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.443
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0742	95% H-UCL	0.0875
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.104
95% Adjusted-CLT UCL (Chen-1995)	0.0736	97.5% Chebyshev (MVUE) UCL	0.12
95% Modified-t UCL (Johnson-1978)	0.0742	99% Chebyshev (MVUE) UCL	0.151
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.66	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0115		
MLE of Mean	0.065		
MLE of Standard Deviation	0.0273		
nu star	169.8		
Approximate Chi Square Value (.05)	140.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.0736
Adjusted Chi Square Value	137.4	95% Jackknife UCL	0.0742
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.972	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.484	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0876
		97.5% Chebyshev(Mean, Sd) UCL	0.0974
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.117
95% Approximate Gamma UCL	0.0785		
95% Adjusted Gamma UCL	0.0804		
Potential UCL to Use		Use 95% Student's-t UCL	0.0742
		or 95% Modified-t UCL	0.0742

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	28.18	Maximum of Log Data	3.339
Mean	15.65	Mean of log Data	2.66
Median	17.11	SD of log Data	0.461
SD	6.359		
Coefficient of Variation	0.406		
Skewness	0.046		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18.54	95% H-UCL	20.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.16
95% Adjusted-CLT UCL (Chen-1995)	18.37	97.5% Chebyshev (MVUE) UCL	27.79
95% Modified-t UCL (Johnson-1978)	18.54	99% Chebyshev (MVUE) UCL	34.92
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.598	Data appear Normal at 5% Significance Level	
Theta Star	3.404		
MLE of Mean	15.65		
MLE of Standard Deviation	7.298		
nu star	137.9		
Approximate Chi Square Value (.05)	111.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	18.35
Adjusted Chi Square Value	108.9	95% Jackknife UCL	18.54
		95% Standard Bootstrap UCL	18.23
Anderson-Darling Test Statistic	0.811	95% Bootstrap-t UCL	18.58
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	18.24
Kolmogorov-Smirnov Test Statistic	0.239	95% Percentile Bootstrap UCL	18.24
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	18.39
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	22.81
		97.5% Chebyshev(Mean, Sd) UCL	25.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31.99
95% Approximate Gamma UCL	19.31		
95% Adjusted Gamma UCL	19.82		
Potential UCL to Use		Use 95% Student's-t UCL	18.54

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	1.01	Minimum of Log Data	0.00995
Maximum	1.57	Maximum of Log Data	0.451
Mean	1.29	Mean of log Data	0.251
Median	1.29	SD of log Data	0.0838
SD	0.106		
Coefficient of Variation	0.082		
Skewness	7.24E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.525
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.338	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.412
95% Adjusted-CLT UCL (Chen-1995)	1.335	97.5% Chebyshev (MVUE) UCL	1.465
95% Modified-t UCL (Johnson-1978)	1.338	99% Chebyshev (MVUE) UCL	1.568
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	124.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0104		
MLE of Mean	1.29		
MLE of Standard Deviation	0.116		
nu star	3735		
Approximate Chi Square Value (.05)	3594	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	1.335
Adjusted Chi Square Value	3577	95% Jackknife UCL	1.338
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.812	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.444	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.409
		97.5% Chebyshev(Mean, Sd) UCL	1.461
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.562
95% Approximate Gamma UCL	1.341		
95% Adjusted Gamma UCL	1.347		
Potential UCL to Use		Use 95% Student's-t UCL	1.338
		or 95% Modified-t UCL	1.338

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	520-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	4.5	Minimum of Log Data	1.504
Maximum	11	Maximum of Log Data	2.398
Mean	8.368	Mean of log Data	2.087
Median	8.368	SD of log Data	0.289
SD	2.267		
Coefficient of Variation	0.271		
Skewness	-0.104		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.895	Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.399	95% H-UCL	9.715
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.14
95% Adjusted-CLT UCL (Chen-1995)	9.314	97.5% Chebyshev (MVUE) UCL	12.33
95% Modified-t UCL (Johnson-1978)	9.397	99% Chebyshev (MVUE) UCL	14.67
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	10.93	Data appear Normal at 5% Significance Level	
Theta Star	0.766		
MLE of Mean	8.368		
MLE of Standard Deviation	2.531		
nu star	327.8		
Approximate Chi Square Value (.05)	286.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9.331
Adjusted Chi Square Value	282.2	95% Jackknife UCL	9.399
		95% Standard Bootstrap UCL	9.273
Anderson-Darling Test Statistic	0.564	95% Bootstrap-t UCL	9.353
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	9.286
Kolmogorov-Smirnov Test Statistic	0.207	95% Percentile Bootstrap UCL	9.266
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9.274
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.92
		97.5% Chebyshev(Mean, Sd) UCL	12.02
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.19
95% Approximate Gamma UCL	9.563		
95% Adjusted Gamma UCL	9.723		
Potential UCL to Use		Use 95% Student's-t UCL	9.399

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.39	Minimum of Log Data	-0.942
Maximum	0.965	Maximum of Log Data	-0.0356
Mean	0.678	Mean of log Data	-0.403
Median	0.678	SD of log Data	0.175
SD	0.109		
Coefficient of Variation	0.16		
Skewness	-3.3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.509
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.727	95% H-UCL	0.738
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.812
95% Adjusted-CLT UCL (Chen-1995)	0.724	97.5% Chebyshev (MVUE) UCL	0.87
95% Modified-t UCL (Johnson-1978)	0.727	99% Chebyshev (MVUE) UCL	0.984
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	30.4	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0223		
MLE of Mean	0.678		
MLE of Standard Deviation	0.123		
nu star	911.9		
Approximate Chi Square Value (.05)	842.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.724
Adjusted Chi Square Value	834.6	95% Jackknife UCL	0.727
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.834	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.8
		97.5% Chebyshev(Mean, Sd) UCL	0.853
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.957
95% Approximate Gamma UCL	0.733		
95% Adjusted Gamma UCL	0.74		
Potential UCL to Use		Use 95% Student's-t UCL	0.727
		or 95% Modified-t UCL	0.727

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cadmium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.47	Minimum of Log Data	-0.755
Maximum	1.67	Maximum of Log Data	0.513
Mean	1.07	Mean of log Data	0.0425
Median	1.07	SD of log Data	0.249
SD	0.227		
Coefficient of Variation	0.212		
Skewness	-1.8E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.493
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.173	95% H-UCL	1.216
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.377
95% Adjusted-CLT UCL (Chen-1995)	1.166	97.5% Chebyshev (MVUE) UCL	1.508
95% Modified-t UCL (Johnson-1978)	1.173	99% Chebyshev (MVUE) UCL	1.765

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	16.07	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0666		
MLE of Mean	1.07		
MLE of Standard Deviation	0.267		
nu star	482.1		
Approximate Chi Square Value (.05)	432.2	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	1.166
Adjusted Chi Square Value	426.4	95% Jackknife UCL	1.173
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.86	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.463	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.325
		97.5% Chebyshev(Mean, Sd) UCL	1.436
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.653
95% Approximate Gamma UCL	1.194		
95% Adjusted Gamma UCL	1.21		

Potential UCL to Use			
		Use 95% Student's-t UCL	1.173
		or 95% Modified-t UCL	1.173

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	13	Minimum of Log Data	2.565
Maximum	85	Maximum of Log Data	4.443
Mean	57.21	Mean of log Data	3.942
Median	57.21	SD of log Data	0.518
SD	23.7		
Coefficient of Variation	0.414		
Skewness	-0.113		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk Test Statistic	0.854
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	67.99	95% H-UCL	78.69
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.46
95% Adjusted-CLT UCL (Chen-1995)	67.09	97.5% Chebyshev (MVUE) UCL	108.7
95% Modified-t UCL (Johnson-1978)	67.96	99% Chebyshev (MVUE) UCL	138.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.999	Data appear Normal at 5% Significance Level	
Theta Star	14.31		
MLE of Mean	57.21		
MLE of Standard Deviation	28.61		
nu star	120		
Approximate Chi Square Value (.05)	95.66	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	67.28
Adjusted Chi Square Value	93	95% Jackknife UCL	67.99
		95% Standard Bootstrap UCL	67.15
Anderson-Darling Test Statistic	0.596	95% Bootstrap-t UCL	67.81
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	66.96
Kolmogorov-Smirnov Test Statistic	0.195	95% Percentile Bootstrap UCL	66.52
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	66.65
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	83.89
		97.5% Chebyshev(Mean, Sd) UCL	95.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	118.1
95% Approximate Gamma UCL	71.74		
95% Adjusted Gamma UCL	73.8		
Potential UCL to Use		Use 95% Student's-t UCL	67.99

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	9.6	Minimum of Log Data	2.262
Maximum	242.7	Maximum of Log Data	5.492
Mean	48.01	Mean of log Data	3.592
Median	35	SD of log Data	0.679
SD	54.88		
Coefficient of Variation	1.143		
Skewness	3.62		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.451	Shapiro Wilk Test Statistic	0.77
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.97	95% H-UCL	69.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	80.98
95% Adjusted-CLT UCL (Chen-1995)	85.47	97.5% Chebyshev (MVUE) UCL	96.6
95% Modified-t UCL (Johnson-1978)	75.18	99% Chebyshev (MVUE) UCL	127.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.597	Data do not follow a Discernable Distribution (0.05)	
Theta Star	30.06		
MLE of Mean	48.01		
MLE of Standard Deviation	37.99		
nu star	47.91		
Approximate Chi Square Value (.05)	33.03	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	71.32
Adjusted Chi Square Value	31.51	95% Jackknife UCL	72.97
		95% Standard Bootstrap UCL	70.75
Anderson-Darling Test Statistic	2.146	95% Bootstrap-t UCL	143.9
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	189.7
Kolmogorov-Smirnov Test Statistic	0.338	95% Percentile Bootstrap UCL	75.19
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	90.87
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	109.8
		97.5% Chebyshev(Mean, Sd) UCL	136.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	189
95% Approximate Gamma UCL	69.65		
95% Adjusted Gamma UCL	73		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	109.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	14
Raw Statistics		Log-transformed Statistics	
Minimum	7280	Minimum of Log Data	8.893
Maximum	30200	Maximum of Log Data	10.32
Mean	13783	Mean of log Data	9.463
Median	12992	SD of log Data	0.367
SD	5834		
Coefficient of Variation	0.423		
Skewness	1.795		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16436	95% H-UCL	16652
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19458
95% Adjusted-CLT UCL (Chen-1995)	17006	97.5% Chebyshev (MVUE) UCL	21946
95% Modified-t UCL (Johnson-1978)	16552	99% Chebyshev (MVUE) UCL	26834
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.06	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2274		
MLE of Mean	13783		
MLE of Standard Deviation	5599		
nu star	181.8		
Approximate Chi Square Value (.05)	151.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	16260
Adjusted Chi Square Value	148.2	95% Jackknife UCL	16436
		95% Standard Bootstrap UCL	16212
Anderson-Darling Test Statistic	0.421	95% Bootstrap-t UCL	18091
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	30074
Kolmogorov-Smirnov Test Statistic	0.163	95% Percentile Bootstrap UCL	16338
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	17108
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20349
		97.5% Chebyshev(Mean, Sd) UCL	23190
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28770
95% Approximate Gamma UCL	16527		
95% Adjusted Gamma UCL	16905		
Potential UCL to Use		Use 95% Approximate Gamma UCL	16527

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	14
Raw Statistics		Log-transformed Statistics	
Minimum	115.3	Minimum of Log Data	4.748
Maximum	1528	Maximum of Log Data	7.332
Mean	424.8	Mean of log Data	5.87
Median	363.3	SD of log Data	0.577
SD	336		
Coefficient of Variation	0.791		
Skewness	2.857		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.649	Shapiro Wilk Test Statistic	0.911
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	577.7	95% H-UCL	583.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	692.1
95% Adjusted-CLT UCL (Chen-1995)	635.9	97.5% Chebyshev (MVUE) UCL	812.7
95% Modified-t UCL (Johnson-1978)	588.3	99% Chebyshev (MVUE) UCL	1050
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.373	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	179.1		
MLE of Mean	424.8		
MLE of Standard Deviation	275.8		
nu star	71.18		
Approximate Chi Square Value (.05)	52.75	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	567.6
Adjusted Chi Square Value	50.8	95% Jackknife UCL	577.7
		95% Standard Bootstrap UCL	564.7
Anderson-Darling Test Statistic	0.945	95% Bootstrap-t UCL	818.5
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	1264
Kolmogorov-Smirnov Test Statistic	0.222	95% Percentile Bootstrap UCL	583
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	642.9
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	803
		97.5% Chebyshev(Mean, Sd) UCL	966.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1288
95% Approximate Gamma UCL	573.2		
95% Adjusted Gamma UCL	595.2		
Potential UCL to Use		Use 95% Approximate Gamma UCL	573.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.0379	Minimum of Log Data	-3.273
Maximum	10	Maximum of Log Data	2.303
Mean	8.444	Mean of log Data	1.55
Median	10	SD of log Data	1.912
SD	3.453		
Coefficient of Variation	0.409		
Skewness	-2.295		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.501	Shapiro Wilk Test Statistic	0.434
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.01	95% H-UCL	276.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.91
95% Adjusted-CLT UCL (Chen-1995)	9.346	97.5% Chebyshev (MVUE) UCL	101.9
95% Modified-t UCL (Johnson-1978)	9.927	99% Chebyshev (MVUE) UCL	149.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.837	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.09		
MLE of Mean	8.444		
MLE of Standard Deviation	9.23		
nu star	25.11		
Approximate Chi Square Value (.05)	14.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9.911
Adjusted Chi Square Value	13.72	95% Jackknife UCL	10.01
		95% Standard Bootstrap UCL	9.853
Anderson-Darling Test Statistic	4.578	95% Bootstrap-t UCL	9.589
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	9.495
Kolmogorov-Smirnov Test Statistic	0.499	95% Percentile Bootstrap UCL	9.772
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	9.502
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.33
		97.5% Chebyshev(Mean, Sd) UCL	14.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.32
95% Approximate Gamma UCL	14.43		
95% Adjusted Gamma UCL	15.45		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.32
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	57.82	Minimum of Log Data	4.057
Maximum	587.2	Maximum of Log Data	6.375
Mean	135.5	Mean of log Data	4.693
Median	112.2	SD of log Data	0.591
SD	129.9		
Coefficient of Variation	0.959		
Skewness	3.382		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.526	Shapiro Wilk Test Statistic	0.81
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	194.6	95% H-UCL	183.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	217
95% Adjusted-CLT UCL (Chen-1995)	222	97.5% Chebyshev (MVUE) UCL	255.4
95% Modified-t UCL (Johnson-1978)	199.5	99% Chebyshev (MVUE) UCL	330.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.02	Data do not follow a Discernable Distribution (0.05)	
Theta Star	67.07		
MLE of Mean	135.5		
MLE of Standard Deviation	95.32		
nu star	60.6		
Approximate Chi Square Value (.05)	43.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	190.7
Adjusted Chi Square Value	41.93	95% Jackknife UCL	194.6
		95% Standard Bootstrap UCL	187.6
Anderson-Darling Test Statistic	1.375	95% Bootstrap-t UCL	289.8
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	405.5
Kolmogorov-Smirnov Test Statistic	0.267	95% Percentile Bootstrap UCL	200.5
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	228.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	281.7
		97.5% Chebyshev(Mean, Sd) UCL	345
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	469.3
95% Approximate Gamma UCL	187.9		
95% Adjusted Gamma UCL	195.8		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	281.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.18	Minimum of Log Data	-1.715
Maximum	12.25	Maximum of Log Data	2.506
Mean	9.497	Mean of log Data	2.048
Median	10	SD of log Data	1.043
SD	2.663		
Coefficient of Variation	0.28		
Skewness	-3.418		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.472	Shapiro Wilk Test Statistic	0.328
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.71	95% H-UCL	29.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	29.03
95% Adjusted-CLT UCL (Chen-1995)	9.979	97.5% Chebyshev (MVUE) UCL	36.11
95% Modified-t UCL (Johnson-1978)	10.61	99% Chebyshev (MVUE) UCL	50
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.138	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.442		
MLE of Mean	9.497		
MLE of Standard Deviation	6.495		
nu star	64.14		
Approximate Chi Square Value (.05)	46.72	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.63
Adjusted Chi Square Value	44.89	95% Jackknife UCL	10.71
		95% Standard Bootstrap UCL	10.6
Anderson-Darling Test Statistic	4.633	95% Bootstrap-t UCL	10.36
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	10.16
Kolmogorov-Smirnov Test Statistic	0.516	95% Percentile Bootstrap UCL	10.36
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	10.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.49
		97.5% Chebyshev(Mean, Sd) UCL	13.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.34
95% Approximate Gamma UCL	13.04		
95% Adjusted Gamma UCL	13.57		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.49
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	7.41	Minimum of Log Data	2.003
Maximum	48.82	Maximum of Log Data	3.888
Mean	18.27	Mean of log Data	2.802
Median	18.8	SD of log Data	0.459
SD	9.678		
Coefficient of Variation	0.53		
Skewness	2.301		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.705	Shapiro Wilk Test Statistic	0.866
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	22.67	95% H-UCL	23.47
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27.79
95% Adjusted-CLT UCL (Chen-1995)	23.96	97.5% Chebyshev (MVUE) UCL	31.96
95% Modified-t UCL (Johnson-1978)	22.92	99% Chebyshev (MVUE) UCL	40.14
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.038	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.524		
MLE of Mean	18.27		
MLE of Standard Deviation	9.091		
nu star	121.1		
Approximate Chi Square Value (.05)	96.72	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	22.38
Adjusted Chi Square Value	94.03	95% Jackknife UCL	22.67
		95% Standard Bootstrap UCL	22.3
Anderson-Darling Test Statistic	1.106	95% Bootstrap-t UCL	24.73
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	42.18
Kolmogorov-Smirnov Test Statistic	0.295	95% Percentile Bootstrap UCL	22.6
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	23.99
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29.16
		97.5% Chebyshev(Mean, Sd) UCL	33.87
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.13
95% Approximate Gamma UCL	22.88		
95% Adjusted Gamma UCL	23.53		
Potential UCL to Use		Use 95% Student's-t UCL	22.67
		or 95% Modified-t UCL	22.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	18.5	Minimum of Log Data	2.918
Maximum	62.5	Maximum of Log Data	4.135
Mean	40.5	Mean of log Data	3.678
Median	40.5	SD of log Data	0.238
SD	8.315		
Coefficient of Variation	0.205		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.495
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	44.28	95% H-UCL	45.75
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.59
95% Adjusted-CLT UCL (Chen-1995)	44.03	97.5% Chebyshev (MVUE) UCL	56.34
95% Modified-t UCL (Johnson-1978)	44.28	99% Chebyshev (MVUE) UCL	65.66
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	17.34	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.336		
MLE of Mean	40.5		
MLE of Standard Deviation	9.727		
nu star	520.1		
Approximate Chi Square Value (.05)	468.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	44.03
Adjusted Chi Square Value	462.1	95% Jackknife UCL	44.28
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.856	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.462	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	49.86
		97.5% Chebyshev(Mean, Sd) UCL	53.91
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	61.86
95% Approximate Gamma UCL	44.99		
95% Adjusted Gamma UCL	45.58		
Potential UCL to Use		Use 95% Student's-t UCL	44.28
		or 95% Modified-t UCL	44.28

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	520-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.17	Minimum of Log Data	-1.772
Maximum	0.96	Maximum of Log Data	-0.0408
Mean	0.565	Mean of log Data	-0.632
Median	0.565	SD of log Data	0.41
SD	0.177		
Coefficient of Variation	0.313		
Skewness	3.5E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.559
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.662	95% H-UCL	0.756
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.887
95% Adjusted-CLT UCL (Chen-1995)	0.653	97.5% Chebyshev (MVUE) UCL	1.023
95% Modified-t UCL (Johnson-1978)	0.662	99% Chebyshev (MVUE) UCL	1.29

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.141	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.092		
MLE of Mean	0.565		
MLE of Standard Deviation	0.228		
nu star	135.1		
Approximate Chi Square Value (.05)	109.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	0.653
Adjusted Chi Square Value	105.5	95% Jackknife UCL	0.662
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.465	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.455	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.797
		97.5% Chebyshev(Mean, Sd) UCL	0.898
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.095
95% Approximate Gamma UCL	0.699		
95% Adjusted Gamma UCL	0.724		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.662
	or 95% Modified-t UCL	0.662

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.4	Minimum of Log Data	1.686
Maximum	11	Maximum of Log Data	2.398
Mean	8.992	Mean of log Data	2.176
Median	8.992	SD of log Data	0.216
SD	1.78		
Coefficient of Variation	0.198		
Skewness	-0.568		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.915	Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.965	95% H-UCL	10.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.58
95% Adjusted-CLT UCL (Chen-1995)	9.777	97.5% Chebyshev (MVUE) UCL	12.69
95% Modified-t UCL (Johnson-1978)	9.95	99% Chebyshev (MVUE) UCL	14.87
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	18.4	Data appear Normal at 5% Significance Level	
Theta Star	0.489		
MLE of Mean	8.992		
MLE of Standard Deviation	2.096		
nu star	404.8		
Approximate Chi Square Value (.05)	359.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	9.875
Adjusted Chi Square Value	352.2	95% Jackknife UCL	9.965
		95% Standard Bootstrap UCL	9.819
Anderson-Darling Test Statistic	0.436	95% Bootstrap-t UCL	9.905
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	9.819
Kolmogorov-Smirnov Test Statistic	0.156	95% Percentile Bootstrap UCL	9.822
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	9.732
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.33
		97.5% Chebyshev(Mean, Sd) UCL	12.34
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.33
95% Approximate Gamma UCL	10.13		
95% Adjusted Gamma UCL	10.34		

Potential UCL to Use			
		Use 95% Student's-t UCL	9.965

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Barium

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	68	Minimum of Log Data	4.22
Maximum	180	Maximum of Log Data	5.193
Mean	124	Mean of log Data	4.8
Median	124	SD of log Data	0.223
SD	25.04		
Coefficient of Variation	0.202		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.6
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	137.7	95% H-UCL	142.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	160.7
95% Adjusted-CLT UCL (Chen-1995)	136.4	97.5% Chebyshev (MVUE) UCL	176.5
95% Modified-t UCL (Johnson-1978)	137.7	99% Chebyshev (MVUE) UCL	207.5
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	17.72	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.999		
MLE of Mean	124		
MLE of Standard Deviation	29.46		
nu star	389.8		
Approximate Chi Square Value (.05)	345	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	136.4
Adjusted Chi Square Value	338.1	95% Jackknife UCL	137.7
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.395	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.436	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	156.9
		97.5% Chebyshev(Mean, Sd) UCL	171.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	199.1
95% Approximate Gamma UCL	140.1		
95% Adjusted Gamma UCL	142.9		
Potential UCL to Use		Use 95% Student's-t UCL	137.7
		or 95% Modified-t UCL	137.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.34	Minimum of Log Data	-1.079
Maximum	0.92	Maximum of Log Data	-0.0834
Mean	0.63	Mean of log Data	-0.484
Median	0.63	SD of log Data	0.228
SD	0.13		
Coefficient of Variation	0.206		
Skewness	7.8E-16		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.599
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.701	95% H-UCL	0.725
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.821
95% Adjusted-CLT UCL (Chen-1995)	0.694	97.5% Chebyshev (MVUE) UCL	0.903
95% Modified-t UCL (Johnson-1978)	0.701	99% Chebyshev (MVUE) UCL	1.064
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	16.98	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0371		
MLE of Mean	0.63		
MLE of Standard Deviation	0.153		
nu star	373.5		
Approximate Chi Square Value (.05)	329.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	0.694
Adjusted Chi Square Value	323	95% Jackknife UCL	0.701
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.397	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.437	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.8
		97.5% Chebyshev(Mean, Sd) UCL	0.874
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.019
95% Approximate Gamma UCL	0.714		
95% Adjusted Gamma UCL	0.729		
Potential UCL to Use		Use 95% Student's-t UCL	0.701
		or 95% Modified-t UCL	0.701

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	21	Minimum of Log Data	3.045
Maximum	85	Maximum of Log Data	4.443
Mean	63.29	Mean of log Data	4.06
Median	63.29	SD of log Data	0.477
SD	24.02		
Coefficient of Variation	0.38		
Skewness	-0.601		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.842	Shapiro Wilk Test Statistic	0.822
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	76.42	95% H-UCL	89.72
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	105.2
95% Adjusted-CLT UCL (Chen-1995)	73.81	97.5% Chebyshev (MVUE) UCL	122.9
95% Modified-t UCL (Johnson-1978)	76.2	99% Chebyshev (MVUE) UCL	157.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.312	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.68		
MLE of Mean	63.29		
MLE of Standard Deviation	30.48		
nu star	94.86		
Approximate Chi Square Value (.05)	73.4	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	75.21
Adjusted Chi Square Value	70.33	95% Jackknife UCL	76.42
		95% Standard Bootstrap UCL	74.56
Anderson-Darling Test Statistic	0.795	95% Bootstrap-t UCL	74.87
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	73.25
Kolmogorov-Smirnov Test Statistic	0.266	95% Percentile Bootstrap UCL	74.21
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	73.06
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	94.87
		97.5% Chebyshev(Mean, Sd) UCL	108.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	135.4
95% Approximate Gamma UCL	81.8		
95% Adjusted Gamma UCL	85.38		
Potential UCL to Use		Use 95% Student's-t UCL	76.42
		or 95% Modified-t UCL	76.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	6965	Minimum of Log Data	8.849
Maximum	29000	Maximum of Log Data	10.28
Mean	13620	Mean of log Data	9.453
Median	13620	SD of log Data	0.369
SD	5764		
Coefficient of Variation	0.423		
Skewness	2.015		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.785	Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	16770	95% H-UCL	17265
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20201
95% Adjusted-CLT UCL (Chen-1995)	17607	97.5% Chebyshev (MVUE) UCL	23077
95% Modified-t UCL (Johnson-1978)	16946	99% Chebyshev (MVUE) UCL	28725
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.676	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2400		
MLE of Mean	13620		
MLE of Standard Deviation	5717		
nu star	124.9		
Approximate Chi Square Value (.05)	100.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	16479
Adjusted Chi Square Value	96.45	95% Jackknife UCL	16770
		95% Standard Bootstrap UCL	16439
Anderson-Darling Test Statistic	0.583	95% Bootstrap-t UCL	18663
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	30426
Kolmogorov-Smirnov Test Statistic	0.218	95% Percentile Bootstrap UCL	16594
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	17762
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	21195
		97.5% Chebyshev(Mean, Sd) UCL	24473
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	30912
95% Approximate Gamma UCL	16997		
95% Adjusted Gamma UCL	17634		
Potential UCL to Use		Use 95% Approximate Gamma UCL	16997

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	192.8	Minimum of Log Data	5.262
Maximum	992.8	Maximum of Log Data	6.901
Mean	409.5	Mean of log Data	5.907
Median	350.3	SD of log Data	0.471
SD	222.9		
Coefficient of Variation	0.544		
Skewness	1.942		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.803	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	531.3	95% H-UCL	564.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	662.3
95% Adjusted-CLT UCL (Chen-1995)	562.1	97.5% Chebyshev (MVUE) UCL	773.2
95% Modified-t UCL (Johnson-1978)	537.9	99% Chebyshev (MVUE) UCL	991
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.534	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	115.9		
MLE of Mean	409.5		
MLE of Standard Deviation	217.8		
nu star	77.76		
Approximate Chi Square Value (.05)	58.44	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	520.1
Adjusted Chi Square Value	55.72	95% Jackknife UCL	531.3
		95% Standard Bootstrap UCL	512.4
Anderson-Darling Test Statistic	0.402	95% Bootstrap-t UCL	613.5
Anderson-Darling 5% Critical Value	0.732	95% Hall's Bootstrap UCL	1034
Kolmogorov-Smirnov Test Statistic	0.166	95% Percentile Bootstrap UCL	525.6
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	553.8
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	702.5
		97.5% Chebyshev(Mean, Sd) UCL	829.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1078
95% Approximate Gamma UCL	544.8		
95% Adjusted Gamma UCL	571.4		
Potential UCL to Use		Use 95% Approximate Gamma UCL	544.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0316	Minimum of Log Data	-3.455
Maximum	10	Maximum of Log Data	2.303
Mean	8.552	Mean of log Data	1.718
Median	10	SD of log Data	1.719
SD	2.998		
Coefficient of Variation	0.351		
Skewness	-2.729		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.566	Shapiro Wilk Test Statistic	0.392
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.19	95% H-UCL	284.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64.76
95% Adjusted-CLT UCL (Chen-1995)	9.244	97.5% Chebyshev (MVUE) UCL	84.6
95% Modified-t UCL (Johnson-1978)	10.07	99% Chebyshev (MVUE) UCL	123.6

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.012	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.452		
MLE of Mean	8.552		
MLE of Standard Deviation	8.502		
nu star	22.26		
Approximate Chi Square Value (.05)	12.53	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	10.04
Adjusted Chi Square Value	11.36	95% Jackknife UCL	10.19
		95% Standard Bootstrap UCL	9.984
Anderson-Darling Test Statistic	3.188	95% Bootstrap-t UCL	9.674
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	9.48
Kolmogorov-Smirnov Test Statistic	0.436	95% Percentile Bootstrap UCL	9.737
Kolmogorov-Smirnov 5% Critical Value	0.261	95% BCA Bootstrap UCL	9.459
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.49
		97.5% Chebyshev(Mean, Sd) UCL	14.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.55
95% Approximate Gamma UCL	15.19		
95% Adjusted Gamma UCL	16.76		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.55
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	65	Minimum of Log Data	4.174
Maximum	220.4	Maximum of Log Data	5.396
Mean	87.22	Mean of log Data	4.391
Median	66.43	SD of log Data	0.365
SD	45.71		
Coefficient of Variation	0.524		
Skewness	2.944		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.546	Shapiro Wilk Test Statistic	0.658
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	112.2	95% H-UCL	108.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	127.4
95% Adjusted-CLT UCL (Chen-1995)	123	97.5% Chebyshev (MVUE) UCL	145.4
95% Modified-t UCL (Johnson-1978)	114.2	99% Chebyshev (MVUE) UCL	180.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.904	Data do not follow a Discernable Distribution (0.05)	
Theta Star	17.79		
MLE of Mean	87.22		
MLE of Standard Deviation	39.39		
nu star	107.9		
Approximate Chi Square Value (.05)	84.91	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	109.9
Adjusted Chi Square Value	81.59	95% Jackknife UCL	112.2
		95% Standard Bootstrap UCL	108.8
Anderson-Darling Test Statistic	1.69	95% Bootstrap-t UCL	173
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	191.3
Kolmogorov-Smirnov Test Statistic	0.277	95% Percentile Bootstrap UCL	113.1
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	125.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	147.3
		97.5% Chebyshev(Mean, Sd) UCL	173.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	224.3
95% Approximate Gamma UCL	110.8		
95% Adjusted Gamma UCL	115.3		
Potential UCL to Use		Use 95% Student's-t UCL	112.2
		or 95% Modified-t UCL	114.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Vanadium

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	18.2	Minimum of Log Data	2.901
Maximum	37.3	Maximum of Log Data	3.619
Mean	27.75	Mean of log Data	3.312
Median	27.75	SD of log Data	0.162
SD	4.271		
Coefficient of Variation	0.154		
Skewness	-2E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.627	Shapiro Wilk Test Statistic	0.612
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	30.08	95% H-UCL	30.54
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.71
95% Adjusted-CLT UCL (Chen-1995)	29.87	97.5% Chebyshev (MVUE) UCL	36.28
95% Modified-t UCL (Johnson-1978)	30.08	99% Chebyshev (MVUE) UCL	41.33
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	31.91	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.87		
MLE of Mean	27.75		
MLE of Standard Deviation	4.912		
nu star	702.1		
Approximate Chi Square Value (.05)	641.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	29.87
Adjusted Chi Square Value	632.2	95% Jackknife UCL	30.08
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.379	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.728	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.429	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.255	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.36
		97.5% Chebyshev(Mean, Sd) UCL	35.79
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	40.56
95% Approximate Gamma UCL	30.37		
95% Adjusted Gamma UCL	30.82		
Potential UCL to Use		Use 95% Student's-t UCL	30.08
		or 95% Modified-t UCL	30.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	520-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Cesium-137

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.00601	Log Statistics Not Available
Maximum	1.61	
Mean	0.537	
Median	0.537	
SD	0.364	
Coefficient of Variation	0.679	
Skewness	1.717	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.608	Not Available	
Shapiro Wilk Critical Value	0.874		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.71	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.71	95% Adjusted-CLT UCL (Chen 1995)	0.745
		95% Modified-t UCL (Johnson-1978)	0.717

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.962	95% CLT UCL	0.697
		95% Jackknife UCL	0.71
		95% Standard Bootstrap UCL	0.696
		95% Bootstrap-t UCL	0.759
		95% Hall's Bootstrap UCL	1.621
		95% Percentile Bootstrap UCL	0.691
		95% BCA Bootstrap UCL	0.729
		95% Chebyshev(Mean, Sd) UCL	0.962
		97.5% Chebyshev(Mean, Sd) UCL	1.145
		99% Chebyshev(Mean, Sd) UCL	1.506

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	7.67	Minimum of Log Data	2.037
Maximum	85	Maximum of Log Data	4.443
Mean	64.69	Mean of log Data	3.986
Median	74.85	SD of log Data	0.775
SD	27.66		
Coefficient of Variation	0.428		
Skewness	-1.292		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.742	Shapiro Wilk Test Statistic	0.649
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	77.78	95% H-UCL	122.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	138.4
95% Adjusted-CLT UCL (Chen-1995)	74.12	97.5% Chebyshev (MVUE) UCL	167.7
95% Modified-t UCL (Johnson-1978)	77.36	99% Chebyshev (MVUE) UCL	225.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.304	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.08		
MLE of Mean	64.69		
MLE of Standard Deviation	42.62		
nu star	64.52		
Approximate Chi Square Value (.05)	47.04	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	76.85
Adjusted Chi Square Value	45.06	95% Jackknife UCL	77.78
		95% Standard Bootstrap UCL	76.2
Anderson-Darling Test Statistic	2.031	95% Bootstrap-t UCL	75.35
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	74.36
Kolmogorov-Smirnov Test Statistic	0.364	95% Percentile Bootstrap UCL	75.47
Kolmogorov-Smirnov 5% Critical Value	0.231	95% BCA Bootstrap UCL	73.94
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	96.92
		97.5% Chebyshev(Mean, Sd) UCL	110.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	138.3
95% Approximate Gamma UCL	88.73		
95% Adjusted Gamma UCL	92.62		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 95% Chebyshev (Mean, Sd) UCL	96.92

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Iron

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	4953	Minimum of Log Data	8.508
Maximum	32605	Maximum of Log Data	10.39
Mean	12544	Mean of log Data	9.349
Median	12083	SD of log Data	0.415
SD	6428		
Coefficient of Variation	0.512		
Skewness	2.553		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.703	Shapiro Wilk Test Statistic	0.886
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	15587	95% H-UCL	15745
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	18571
95% Adjusted-CLT UCL (Chen-1995)	16623	97.5% Chebyshev (MVUE) UCL	21226
95% Modified-t UCL (Johnson-1978)	15782	99% Chebyshev (MVUE) UCL	26442
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.614	Data appear Lognormal at 5% Significance Level	
Theta Star	2719		
MLE of Mean	12544		
MLE of Standard Deviation	5840		
nu star	129.2		
Approximate Chi Square Value (.05)	103.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	15370
Adjusted Chi Square Value	100.9	95% Jackknife UCL	15587
		95% Standard Bootstrap UCL	15321
Anderson-Darling Test Statistic	0.953	95% Bootstrap-t UCL	18676
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	29547
Kolmogorov-Smirnov Test Statistic	0.302	95% Percentile Bootstrap UCL	15565
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	16968
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20033
		97.5% Chebyshev(Mean, Sd) UCL	23274
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	29639
95% Approximate Gamma UCL	15593		
95% Adjusted Gamma UCL	16056		
Potential UCL to Use		Use 95% Student's-t UCL	15587
		or 95% Modified-t UCL	15782
		or 95% H-UCL	15745

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	6

Raw Statistics		Log-transformed Statistics	
Minimum	0.0277	Minimum of Log Data	-3.586
Maximum	10.68	Maximum of Log Data	2.368
Mean	8.031	Mean of log Data	1.465
Median	9.765	SD of log Data	1.958
SD	3.508		
Coefficient of Variation	0.437		
Skewness	-1.974		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.641	Shapiro Wilk Test Statistic	0.485
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.691	95% H-UCL	355.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.65
95% Adjusted-CLT UCL (Chen-1995)	9.044	97.5% Chebyshev (MVUE) UCL	101.9
95% Modified-t UCL (Johnson-1978)	9.609	99% Chebyshev (MVUE) UCL	149.4

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.787	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.21		
MLE of Mean	8.031		
MLE of Standard Deviation	9.054		
nu star	22.03		
Approximate Chi Square Value (.05)	12.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	9.573
Adjusted Chi Square Value	11.41	95% Jackknife UCL	9.691
		95% Standard Bootstrap UCL	9.514
Anderson-Darling Test Statistic	3.668	95% Bootstrap-t UCL	9.307
Anderson-Darling 5% Critical Value	0.762	95% Hall's Bootstrap UCL	9.115
Kolmogorov-Smirnov Test Statistic	0.493	95% Percentile Bootstrap UCL	9.394
Kolmogorov-Smirnov 5% Critical Value	0.236	95% BCA Bootstrap UCL	9.106
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.12
		97.5% Chebyshev(Mean, Sd) UCL	13.89
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.36
95% Approximate Gamma UCL	14.31		
95% Adjusted Gamma UCL	15.51		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.36
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics
Minimum	-0.00393	Log Statistics Not Available
Maximum	1.1	
Mean	0.366	
Median	0.366	
SD	0.249	
Coefficient of Variation	0.682	
Skewness	1.717	

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.607	Not Available	
Shapiro Wilk Critical Value	0.874		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.484	95% H-UCL	N/A
Assuming Normal Distribution		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.484	95% Adjusted-CLT UCL (Chen 1995)	0.508
		95% Modified-t UCL (Johnson-1978)	0.489

Gamma Distribution Test	Data Distribution
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCL to Use

Use 95% Chebyshev (Mean, Sd) UCL	0.656	95% CLT UCL	0.475
		95% Jackknife UCL	0.484
		95% Standard Bootstrap UCL	0.472
		95% Bootstrap-t UCL	0.518
		95% Hall's Bootstrap UCL	1.108
		95% Percentile Bootstrap UCL	0.471
		95% BCA Bootstrap UCL	0.497
		95% Chebyshev(Mean, Sd) UCL	0.656
		97.5% Chebyshev(Mean, Sd) UCL	0.782
		99% Chebyshev(Mean, Sd) UCL	1.029

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	6.25	Minimum of Log Data	1.833
Maximum	648	Maximum of Log Data	6.474
Mean	166.2	Mean of log Data	4.743
Median	140.7	SD of log Data	1.037
SD	154.1		
Coefficient of Variation	0.927		
Skewness	2.577		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.715	Shapiro Wilk Test Statistic	0.85
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	239.1	95% H-UCL	446.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	431.1
95% Adjusted-CLT UCL (Chen-1995)	264.3	97.5% Chebyshev (MVUE) UCL	537.1
95% Modified-t UCL (Johnson-1978)	243.9	99% Chebyshev (MVUE) UCL	745.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.222	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	136		
MLE of Mean	166.2		
MLE of Standard Deviation	150.3		
nu star	34.23		
Approximate Chi Square Value (.05)	21.85	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	234
Adjusted Chi Square Value	20.54	95% Jackknife UCL	239.1
		95% Standard Bootstrap UCL	230.7
Anderson-Darling Test Statistic	0.542	95% Bootstrap-t UCL	311.5
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	532.6
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	239.2
Kolmogorov-Smirnov 5% Critical Value	0.233	95% BCA Bootstrap UCL	271
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	345.8
		97.5% Chebyshev(Mean, Sd) UCL	423.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	576.1
95% Approximate Gamma UCL	260.4		
95% Adjusted Gamma UCL	276.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	260.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	0.044	Minimum of Log Data	-3.124
Maximum	13.95	Maximum of Log Data	2.635
Mean	9.524	Mean of log Data	1.933
Median	10	SD of log Data	1.459
SD	2.962		
Coefficient of Variation	0.311		
Skewness	-2.624		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.581	Shapiro Wilk Test Statistic	0.349
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.93	95% H-UCL	86.4
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.09
95% Adjusted-CLT UCL (Chen-1995)	10.23	97.5% Chebyshev (MVUE) UCL	65.61
95% Modified-t UCL (Johnson-1978)	10.83	99% Chebyshev (MVUE) UCL	94.13

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.389	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.857		
MLE of Mean	9.524		
MLE of Standard Deviation	8.081		
nu star	38.89		
Approximate Chi Square Value (.05)	25.61	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	10.83
Adjusted Chi Square Value	24.19	95% Jackknife UCL	10.93
		95% Standard Bootstrap UCL	10.78
Anderson-Darling Test Statistic	4.177	95% Bootstrap-t UCL	10.49
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	10.41
Kolmogorov-Smirnov Test Statistic	0.53	95% Percentile Bootstrap UCL	10.61
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	10.43
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.97
		97.5% Chebyshev(Mean, Sd) UCL	14.47
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.4
95% Approximate Gamma UCL	14.47		
95% Adjusted Gamma UCL	15.32		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thorium-230

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	4
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.201	Minimum of Log Data	-1.604
Maximum	18.7	Maximum of Log Data	2.929
Mean	6.52	Mean of log Data	1.538
Median	6.52	SD of log Data	1.14
SD	4.138		
Coefficient of Variation	0.635		
Skewness	1.714		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.611	Shapiro Wilk Test Statistic	0.584
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.478	95% H-UCL	23.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.47
95% Adjusted-CLT UCL (Chen-1995)	8.88	97.5% Chebyshev (MVUE) UCL	25.73
95% Modified-t UCL (Johnson-1978)	8.563	99% Chebyshev (MVUE) UCL	36.07
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.328	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.908		
MLE of Mean	6.52		
MLE of Standard Deviation	5.657		
nu star	37.2		
Approximate Chi Square Value (.05)	24.23	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0312	95% CLT UCL	8.339
Adjusted Chi Square Value	22.85	95% Jackknife UCL	8.478
		95% Standard Bootstrap UCL	8.284
Anderson-Darling Test Statistic	2.893	95% Bootstrap-t UCL	9.039
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	18.84
Kolmogorov-Smirnov Test Statistic	0.461	95% Percentile Bootstrap UCL	8.26
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	8.292
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.34
		97.5% Chebyshev(Mean, Sd) UCL	13.43
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.52
95% Approximate Gamma UCL	10.01		
95% Adjusted Gamma UCL	10.61		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.34

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.0318	Minimum of Log Data	-3.447
Maximum	0.49	Maximum of Log Data	-0.713
Mean	0.261	Mean of log Data	-1.449
Median	0.261	SD of log Data	0.599
SD	0.0899		
Coefficient of Variation	0.344		
Skewness	-3.9E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.551	Shapiro Wilk Test Statistic	0.442
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.303	95% H-UCL	0.405
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.478
95% Adjusted-CLT UCL (Chen-1995)	0.3	97.5% Chebyshev (MVUE) UCL	0.565
95% Modified-t UCL (Johnson-1978)	0.303	99% Chebyshev (MVUE) UCL	0.735
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.907	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0668		
MLE of Mean	0.261		
MLE of Standard Deviation	0.132		
nu star	109.4		
Approximate Chi Square Value (.05)	86.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.3
Adjusted Chi Square Value	83.52	95% Jackknife UCL	0.303
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.667	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.489	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.366
		97.5% Chebyshev(Mean, Sd) UCL	0.411
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.5
95% Approximate Gamma UCL	0.331		
95% Adjusted Gamma UCL	0.342		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.366

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	14	Number of Distinct Observations	7

Raw Statistics		Log-transformed Statistics	
Minimum	0.475	Minimum of Log Data	-0.744
Maximum	22.94	Maximum of Log Data	3.133
Mean	15.56	Mean of log Data	2.484
Median	16.98	SD of log Data	1.051
SD	6.6		
Coefficient of Variation	0.424		
Skewness	-1.427		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.812	Shapiro Wilk Test Statistic	0.585
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	18.68	95% H-UCL	48.17
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.02
95% Adjusted-CLT UCL (Chen-1995)	17.74	97.5% Chebyshev (MVUE) UCL	57.41
95% Modified-t UCL (Johnson-1978)	18.57	99% Chebyshev (MVUE) UCL	79.78
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.677	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.278		
MLE of Mean	15.56		
MLE of Standard Deviation	12.01		
nu star	46.95		
Approximate Chi Square Value (.05)	32.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	18.46
Adjusted Chi Square Value	30.61	95% Jackknife UCL	18.68
		95% Standard Bootstrap UCL	18.4
Anderson-Darling Test Statistic	2.103	95% Bootstrap-t UCL	17.97
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	17.75
Kolmogorov-Smirnov Test Statistic	0.378	95% Percentile Bootstrap UCL	18.2
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	17.78
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23.24
		97.5% Chebyshev(Mean, Sd) UCL	26.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	33.11
95% Approximate Gamma UCL	22.66		
95% Adjusted Gamma UCL	23.86		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	23.24
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.00141	Minimum of Log Data	-6.564
Maximum	0.19	Maximum of Log Data	-1.661
Mean	0.0811	Mean of log Data	-2.772
Median	0.0811	SD of log Data	1.123
SD	0.0383		
Coefficient of Variation	0.472		
Skewness	1.213		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.62	Shapiro Wilk Test Statistic	0.452
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.0993	95% H-UCL	0.299
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.268
95% Adjusted-CLT UCL (Chen-1995)	0.102	97.5% Chebyshev (MVUE) UCL	0.336
95% Modified-t UCL (Johnson-1978)	0.0998	99% Chebyshev (MVUE) UCL	0.471

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.675	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0484		
MLE of Mean	0.0811		
MLE of Standard Deviation	0.0627		
nu star	46.89		
Approximate Chi Square Value (.05)	32.18	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	0.098
Adjusted Chi Square Value	30.57	95% Jackknife UCL	0.0993
		95% Standard Bootstrap UCL	0.0974
Anderson-Darling Test Statistic	3.218	95% Bootstrap-t UCL	0.102
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	0.135
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	0.0967
Kolmogorov-Smirnov 5% Critical Value	0.232	95% BCA Bootstrap UCL	0.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.126
		97.5% Chebyshev(Mean, Sd) UCL	0.145
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.183
95% Approximate Gamma UCL	0.118		
95% Adjusted Gamma UCL	0.124		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.126

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	14	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.159	Minimum of Log Data	-1.839
Maximum	6.14	Maximum of Log Data	1.815
Mean	2.456	Mean of log Data	0.709
Median	2.456	SD of log Data	0.81
SD	1.264		
Coefficient of Variation	0.515		
Skewness	1.564		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.624	Shapiro Wilk Test Statistic	0.565
Shapiro Wilk Critical Value	0.874	Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3.055	95% H-UCL	4.937
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	5.487
95% Adjusted-CLT UCL (Chen-1995)	3.163	97.5% Chebyshev (MVUE) UCL	6.675
95% Modified-t UCL (Johnson-1978)	3.078	99% Chebyshev (MVUE) UCL	9.011
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.243	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.095		
MLE of Mean	2.456		
MLE of Standard Deviation	1.64		
nu star	62.82		
Approximate Chi Square Value (.05)	45.58	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	3.012
Adjusted Chi Square Value	43.64	95% Jackknife UCL	3.055
		95% Standard Bootstrap UCL	3.011
Anderson-Darling Test Statistic	2.758	95% Bootstrap-t UCL	3.196
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	6.352
Kolmogorov-Smirnov Test Statistic	0.437	95% Percentile Bootstrap UCL	3.048
Kolmogorov-Smirnov 5% Critical Value	0.231	95% BCA Bootstrap UCL	3.082
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.929
		97.5% Chebyshev(Mean, Sd) UCL	4.566
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	5.818
95% Approximate Gamma UCL	3.385		
95% Adjusted Gamma UCL	3.536		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	3.929

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets
User Selected Options

From File	520-02.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Beryllium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.45	Minimum of Log Data	-0.799
Maximum	0.67	Maximum of Log Data	-0.4
Mean	0.56	Mean of log Data	-0.582
Median	0.56	SD of log Data	0.0755
SD	0.0416		
Coefficient of Variation	0.0742		
Skewness	-1E-14		

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However, results obtained using 4 to 9 distinct values may not be reliable.
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Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.579	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.608
95% Adjusted-CLT UCL (Chen-1995)	0.578	97.5% Chebyshev (MVUE) UCL	0.628
95% Modified-t UCL (Johnson-1978)	0.579	99% Chebyshev (MVUE) UCL	0.669

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	152.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00367		
MLE of Mean	0.56		
MLE of Standard Deviation	0.0453		
nu star	4580		
Approximate Chi Square Value (.05)	4424	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.578
Adjusted Chi Square Value	4405	95% Jackknife UCL	0.579
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.81	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.443	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.607
		97.5% Chebyshev(Mean, Sd) UCL	0.627
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.667
95% Approximate Gamma UCL	0.58		
95% Adjusted Gamma UCL	0.582		

Potential UCL to Use		
	Use 95% Student's-t UCL	0.579
	or 95% Modified-t UCL	0.579

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	14.4	Minimum of Log Data	2.667
Maximum	85	Maximum of Log Data	4.443
Mean	70.36	Mean of log Data	4.133
Median	85	SD of log Data	0.601
SD	25.69		
Coefficient of Variation	0.365		
Skewness	-1.612		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.587
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	82.04	95% H-UCL	106.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	125.6
95% Adjusted-CLT UCL (Chen-1995)	78.32	97.5% Chebyshev (MVUE) UCL	148.1
95% Modified-t UCL (Johnson-1978)	81.58	99% Chebyshev (MVUE) UCL	192.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.497	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20.12		
MLE of Mean	70.36		
MLE of Standard Deviation	37.62		
nu star	104.9		
Approximate Chi Square Value (.05)	82.27	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	81.27
Adjusted Chi Square Value	79.81	95% Jackknife UCL	82.04
		95% Standard Bootstrap UCL	80.77
Anderson-Darling Test Statistic	2.895	95% Bootstrap-t UCL	79.57
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	78.56
Kolmogorov-Smirnov Test Statistic	0.38	95% Percentile Bootstrap UCL	79.83
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	78.6
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	99.27
		97.5% Chebyshev(Mean, Sd) UCL	111.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	136.4
95% Approximate Gamma UCL	89.72		
95% Adjusted Gamma UCL	92.49		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 95% Chebyshev (Mean, Sd) UCL	99.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15
Raw Statistics		Log-transformed Statistics	
Minimum	89.24	Minimum of Log Data	4.491
Maximum	1762	Maximum of Log Data	7.474
Mean	421.2	Mean of log Data	5.816
Median	329.9	SD of log Data	0.647
SD	390		
Coefficient of Variation	0.926		
Skewness	3.244		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.586	Shapiro Wilk Test Statistic	0.914
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	598.6	95% H-UCL	609.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	717.2
95% Adjusted-CLT UCL (Chen-1995)	677	97.5% Chebyshev (MVUE) UCL	851.5
95% Modified-t UCL (Johnson-1978)	612.7	99% Chebyshev (MVUE) UCL	1115
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.924	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	219		
MLE of Mean	421.2		
MLE of Standard Deviation	303.7		
nu star	57.72		
Approximate Chi Square Value (.05)	41.25	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	586.9
Adjusted Chi Square Value	39.54	95% Jackknife UCL	598.6
		95% Standard Bootstrap UCL	580.7
Anderson-Darling Test Statistic	0.929	95% Bootstrap-t UCL	856.1
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	1278
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	611.3
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	699.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	860.2
		97.5% Chebyshev(Mean, Sd) UCL	1050
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1423
95% Approximate Gamma UCL	589.4		
95% Adjusted Gamma UCL	614.9		
Potential UCL to Use		Use 95% Approximate Gamma UCL	589.4

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0489	Minimum of Log Data	-3.018
Maximum	11.88	Maximum of Log Data	2.475
Mean	8.723	Mean of log Data	1.689
Median	10	SD of log Data	1.648
SD	3.543		
Coefficient of Variation	0.406		
Skewness	-2.256		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.454
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.33	95% H-UCL	116.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	55.29
95% Adjusted-CLT UCL (Chen-1995)	9.659	97.5% Chebyshev (MVUE) UCL	71.57
95% Modified-t UCL (Johnson-1978)	10.25	99% Chebyshev (MVUE) UCL	103.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.995	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.768		
MLE of Mean	8.723		
MLE of Standard Deviation	8.746		
nu star	29.85		
Approximate Chi Square Value (.05)	18.37	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.23
Adjusted Chi Square Value	17.27	95% Jackknife UCL	10.33
		95% Standard Bootstrap UCL	10.12
Anderson-Darling Test Statistic	4.381	95% Bootstrap-t UCL	9.943
Anderson-Darling 5% Critical Value	0.76	95% Hall's Bootstrap UCL	9.739
Kolmogorov-Smirnov Test Statistic	0.488	95% Percentile Bootstrap UCL	10.04
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	9.915
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.71
		97.5% Chebyshev(Mean, Sd) UCL	14.44
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	17.83
95% Approximate Gamma UCL	14.17		
95% Adjusted Gamma UCL	15.08		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	17.83
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.025	Minimum of Log Data	-3.689
Maximum	0.11	Maximum of Log Data	-2.207
Mean	0.0675	Mean of log Data	-2.729
Median	0.0675	SD of log Data	0.294
SD	0.0161		
Coefficient of Variation	0.238		
Skewness	-4E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.482
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0748	95% H-UCL	0.079
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0906
95% Adjusted-CLT UCL (Chen-1995)	0.0743	97.5% Chebyshev (MVUE) UCL	0.1
95% Modified-t UCL (Johnson-1978)	0.0748	99% Chebyshev (MVUE) UCL	0.12
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	12.06	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0056		
MLE of Mean	0.0675		
MLE of Standard Deviation	0.0194		
nu star	361.8		
Approximate Chi Square Value (.05)	318.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.0743
Adjusted Chi Square Value	313.7	95% Jackknife UCL	0.0748
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.88	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.468	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0856
		97.5% Chebyshev(Mean, Sd) UCL	0.0934
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.109
95% Approximate Gamma UCL	0.0766		
95% Adjusted Gamma UCL	0.0778		
Potential UCL to Use		Use 95% Student's-t UCL	0.0748
		or 95% Modified-t UCL	0.0748

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	14
Raw Statistics		Log-transformed Statistics	
Minimum	43.2	Minimum of Log Data	3.766
Maximum	809.8	Maximum of Log Data	6.697
Mean	206	Mean of log Data	4.989
Median	142.4	SD of log Data	0.825
SD	201.9		
Coefficient of Variation	0.98		
Skewness	2.211		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.746	Shapiro Wilk Test Statistic	0.971
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	297.9	95% H-UCL	356.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	399.4
95% Adjusted-CLT UCL (Chen-1995)	323.6	97.5% Chebyshev (MVUE) UCL	485.6
95% Modified-t UCL (Johnson-1978)	302.8	99% Chebyshev (MVUE) UCL	654.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.341	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	153.7		
MLE of Mean	206		
MLE of Standard Deviation	178		
nu star	40.22		
Approximate Chi Square Value (.05)	26.69	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	291.8
Adjusted Chi Square Value	25.33	95% Jackknife UCL	297.9
		95% Standard Bootstrap UCL	288.9
Anderson-Darling Test Statistic	0.41	95% Bootstrap-t UCL	386.6
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	670.5
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	294
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	334.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	433.3
		97.5% Chebyshev(Mean, Sd) UCL	531.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	724.8
95% Approximate Gamma UCL	310.5		
95% Adjusted Gamma UCL	327.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	310.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.0638	Minimum of Log Data	-2.752
Maximum	0.497	Maximum of Log Data	-0.7
Mean	0.28	Mean of log Data	-1.333
Median	0.28	SD of log Data	0.419
SD	0.0818		
Coefficient of Variation	0.292		
Skewness	0		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.454
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.317	95% H-UCL	0.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.424
95% Adjusted-CLT UCL (Chen-1995)	0.315	97.5% Chebyshev (MVUE) UCL	0.484
95% Modified-t UCL (Johnson-1978)	0.317	99% Chebyshev (MVUE) UCL	0.601
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.785	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0413		
MLE of Mean	0.28		
MLE of Standard Deviation	0.108		
nu star	203.6		
Approximate Chi Square Value (.05)	171.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.315
Adjusted Chi Square Value	167.9	95% Jackknife UCL	0.317
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.942	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.479	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.372
		97.5% Chebyshev(Mean, Sd) UCL	0.412
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.49
95% Approximate Gamma UCL	0.333		
95% Adjusted Gamma UCL	0.34		
Potential UCL to Use		Use 95% Student's-t UCL	0.317
		or 95% Modified-t UCL	0.317

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	8.45	Minimum of Log Data	2.134
Maximum	114	Maximum of Log Data	4.736
Mean	26.7	Mean of log Data	3
Median	20	SD of log Data	0.701
SD	27.3		
Coefficient of Variation	1.022		
Skewness	2.756		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.615	Shapiro Wilk Test Statistic	0.881
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	39.12	95% H-UCL	39.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	46.12
95% Adjusted-CLT UCL (Chen-1995)	43.65	97.5% Chebyshev (MVUE) UCL	55.18
95% Modified-t UCL (Johnson-1978)	39.95	99% Chebyshev (MVUE) UCL	72.97
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.57	Data appear Lognormal at 5% Significance Level	
Theta Star	17.01		
MLE of Mean	26.7		
MLE of Standard Deviation	21.31		
nu star	47.09		
Approximate Chi Square Value (.05)	32.34	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	38.29
Adjusted Chi Square Value	30.84	95% Jackknife UCL	39.12
		95% Standard Bootstrap UCL	37.89
Anderson-Darling Test Statistic	1.173	95% Bootstrap-t UCL	67.69
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	97.82
Kolmogorov-Smirnov Test Statistic	0.286	95% Percentile Bootstrap UCL	39.07
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	43.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	57.42
		97.5% Chebyshev(Mean, Sd) UCL	70.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	96.83
95% Approximate Gamma UCL	38.88		
95% Adjusted Gamma UCL	40.77		
Potential UCL to Use		Use 95% H-UCL	39.56

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.38	Minimum of Log Data	0.322
Maximum	2.06	Maximum of Log Data	0.723
Mean	1.72	Mean of log Data	0.54
Median	1.72	SD of log Data	0.076
SD	0.129		
Coefficient of Variation	0.0747		
Skewness	5.9E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.53	Shapiro Wilk Test Statistic	0.526
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1.778	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.867
95% Adjusted-CLT UCL (Chen-1995)	1.775	97.5% Chebyshev (MVUE) UCL	1.931
95% Modified-t UCL (Johnson-1978)	1.778	99% Chebyshev (MVUE) UCL	2.056
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	150.7	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0114		
MLE of Mean	1.72		
MLE of Standard Deviation	0.14		
nu star	4521		
Approximate Chi Square Value (.05)	4366	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	1.775
Adjusted Chi Square Value	4347	95% Jackknife UCL	1.778
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	3.81	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.443	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.865
		97.5% Chebyshev(Mean, Sd) UCL	1.927
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.05
95% Approximate Gamma UCL	1.781		
95% Adjusted Gamma UCL	1.789		
Potential UCL to Use		Use 95% Student's-t UCL	1.778
		or 95% Modified-t UCL	1.778

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	520-03.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	17.6	Minimum of Log Data	2.868
Maximum	85	Maximum of Log Data	4.443
Mean	74.24	Mean of log Data	4.23
Median	85	SD of log Data	0.471
SD	22.72		
Coefficient of Variation	0.306		
Skewness	-1.845		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.534	Shapiro Wilk Test Statistic	0.529
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	84.58	95% H-UCL	99.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	117.6
95% Adjusted-CLT UCL (Chen-1995)	80.91	97.5% Chebyshev (MVUE) UCL	135.6
95% Modified-t UCL (Johnson-1978)	84.11	99% Chebyshev (MVUE) UCL	170.8

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.366	Data do not follow a Discernable Distribution (0.05)	
Theta Star	13.84		
MLE of Mean	74.24		
MLE of Standard Deviation	32.05		
nu star	161		
Approximate Chi Square Value (.05)	132.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	83.89
Adjusted Chi Square Value	129.5	95% Jackknife UCL	84.58
		95% Standard Bootstrap UCL	83.2
Anderson-Darling Test Statistic	3.587	95% Bootstrap-t UCL	82.38
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	81.34
Kolmogorov-Smirnov Test Statistic	0.486	95% Percentile Bootstrap UCL	81.76
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	80.51
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	99.81
		97.5% Chebyshev(Mean, Sd) UCL	110.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	132.6
95% Approximate Gamma UCL	90.1		
95% Adjusted Gamma UCL	92.31		

Potential UCL to Use		
	Use 95% Student's-t UCL	84.58
	or 95% Modified-t UCL	84.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	12.4	Minimum of Log Data	2.518
Maximum	239.6	Maximum of Log Data	5.479
Mean	53.4	Mean of log Data	3.689
Median	35	SD of log Data	0.677
SD	58.33		
Coefficient of Variation	1.092		
Skewness	2.855		

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.491	Shapiro Wilk Test Statistic	0.657
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	79.93	95% H-UCL	75.95
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88.99
95% Adjusted-CLT UCL (Chen-1995)	90.04	97.5% Chebyshev (MVUE) UCL	106.1
95% Modified-t UCL (Johnson-1978)	81.78	99% Chebyshev (MVUE) UCL	139.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.55	Data do not follow a Discernable Distribution (0.05)	
Theta Star	34.44		
MLE of Mean	53.4		
MLE of Standard Deviation	42.89		
nu star	46.51		
Approximate Chi Square Value (.05)	31.86	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	78.17
Adjusted Chi Square Value	30.38	95% Jackknife UCL	79.93
		95% Standard Bootstrap UCL	77.51
Anderson-Darling Test Statistic	3.182	95% Bootstrap-t UCL	251.5
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	391.2
Kolmogorov-Smirnov Test Statistic	0.48	95% Percentile Bootstrap UCL	80.56
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	87.93
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	119
		97.5% Chebyshev(Mean, Sd) UCL	147.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	203.3
95% Approximate Gamma UCL	77.95		
95% Adjusted Gamma UCL	81.77		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	119

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	9
Raw Statistics		**Log-transformed Statistics**	
Minimum	23.1	Minimum of Log Data	3.14
Maximum	631	Maximum of Log Data	6.447
Mean	152.2	Mean of log Data	4.659
Median	65	SD of log Data	0.843
SD	159		
Coefficient of Variation	1.044		
Skewness	2.272		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.697	Shapiro Wilk Test Statistic	0.901
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	224.5	95% H-UCL	264.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	294.8
95% Adjusted-CLT UCL (Chen-1995)	245.4	97.5% Chebyshev (MVUE) UCL	359.2
95% Modified-t UCL (Johnson-1978)	228.5	99% Chebyshev (MVUE) UCL	485.6
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.254	Data appear Lognormal at 5% Significance Level	
Theta Star	121.4		
MLE of Mean	152.2		
MLE of Standard Deviation	135.9		
nu star	37.61		
Approximate Chi Square Value (.05)	24.57	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	219.7
Adjusted Chi Square Value	23.28	95% Jackknife UCL	224.5
		95% Standard Bootstrap UCL	216.9
Anderson-Darling Test Statistic	1.068	95% Bootstrap-t UCL	286.1
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	425.3
Kolmogorov-Smirnov Test Statistic	0.268	95% Percentile Bootstrap UCL	222.7
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	244.1
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	331.1
		97.5% Chebyshev(Mean, Sd) UCL	408.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	560.6
95% Approximate Gamma UCL	233		
95% Adjusted Gamma UCL	245.9		

Potential UCL to Use		Use 95% H-UCL	264.8

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.063	Minimum of Log Data	-2.765
Maximum	13.32	Maximum of Log Data	2.589
Mean	9.559	Mean of log Data	1.984
Median	10	SD of log Data	1.316
SD	2.763		
Coefficient of Variation	0.289		
Skewness	-3.135		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.436	Shapiro Wilk Test Statistic	0.314
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.82	95% H-UCL	54.71
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.97
95% Adjusted-CLT UCL (Chen-1995)	10.12	97.5% Chebyshev (MVUE) UCL	53.32
95% Modified-t UCL (Johnson-1978)	10.72	99% Chebyshev (MVUE) UCL	75.63

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.627	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.876		
MLE of Mean	9.559		
MLE of Standard Deviation	7.494		
nu star	48.81		
Approximate Chi Square Value (.05)	33.77	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.73
Adjusted Chi Square Value	32.23	95% Jackknife UCL	10.82
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	5.006	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.552	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.67
		97.5% Chebyshev(Mean, Sd) UCL	14.01
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	16.66
95% Approximate Gamma UCL	13.82		
95% Adjusted Gamma UCL	14.47		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	12.67

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	6.4	Minimum of Log Data	1.856
Maximum	28.18	Maximum of Log Data	3.339
Mean	16.51	Mean of log Data	2.729
Median	20	SD of log Data	0.425
SD	5.986		
Coefficient of Variation	0.363		
Skewness	-0.176		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.894	Shapiro Wilk Test Statistic	0.861
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	19.23	95% H-UCL	21.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24.8
95% Adjusted-CLT UCL (Chen-1995)	18.97	97.5% Chebyshev (MVUE) UCL	28.32
95% Modified-t UCL (Johnson-1978)	19.22	99% Chebyshev (MVUE) UCL	35.24

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.502	Data appear Normal at 5% Significance Level	
Theta Star	3		
MLE of Mean	16.51		
MLE of Standard Deviation	7.037		
nu star	165.1		
Approximate Chi Square Value (.05)	136.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	19.05
Adjusted Chi Square Value	133.1	95% Jackknife UCL	19.23
		95% Standard Bootstrap UCL	18.96
Anderson-Darling Test Statistic	0.998	95% Bootstrap-t UCL	19.05
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	19.07
Kolmogorov-Smirnov Test Statistic	0.274	95% Percentile Bootstrap UCL	18.9
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	18.74
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23.24
		97.5% Chebyshev(Mean, Sd) UCL	26.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31.88
95% Approximate Gamma UCL	19.98		
95% Adjusted Gamma UCL	20.46		

Potential UCL to Use		Use 95% Student's-t UCL	19.23

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options

From File	520-04.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	5

Raw Statistics		Log-transformed Statistics	
Minimum	13	Minimum of Log Data	2.565
Maximum	85	Maximum of Log Data	4.443
Mean	71.9	Mean of log Data	4.18
Median	85	SD of log Data	0.538
SD	23.59		
Coefficient of Variation	0.328		
Skewness	-1.737		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.629	Shapiro Wilk Test Statistic	0.576
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	82.63	95% H-UCL	102.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	121.5
95% Adjusted-CLT UCL (Chen-1995)	79.01	97.5% Chebyshev (MVUE) UCL	141.7
95% Modified-t UCL (Johnson-1978)	82.18	99% Chebyshev (MVUE) UCL	181.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.364	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.48		
MLE of Mean	71.9		
MLE of Standard Deviation	34.42		
nu star	130.9		
Approximate Chi Square Value (.05)	105.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	81.92
Adjusted Chi Square Value	102.7	95% Jackknife UCL	82.63
		95% Standard Bootstrap UCL	81.49
Anderson-Darling Test Statistic	2.826	95% Bootstrap-t UCL	80.05
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	79.38
Kolmogorov-Smirnov Test Statistic	0.373	95% Percentile Bootstrap UCL	80.7
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	79.26
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	98.45
		97.5% Chebyshev(Mean, Sd) UCL	109.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	132.5
95% Approximate Gamma UCL	89.24		
95% Adjusted Gamma UCL	91.68		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	98.45
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Copper

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	6
Raw Statistics		Log-transformed Statistics	
Minimum	9.6	Minimum of Log Data	2.262
Maximum	242.7	Maximum of Log Data	5.492
Mean	49.55	Mean of log Data	3.653
Median	35	SD of log Data	0.635
SD	54.26		
Coefficient of Variation	1.095		
Skewness	3.666		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.427	Shapiro Wilk Test Statistic	0.695
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	74.23	95% H-UCL	68.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	81.24
95% Adjusted-CLT UCL (Chen-1995)	86.77	97.5% Chebyshev (MVUE) UCL	96.28
95% Modified-t UCL (Johnson-1978)	76.44	99% Chebyshev (MVUE) UCL	125.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.768	Data do not follow a Discernable Distribution (0.05)	
Theta Star	28.04		
MLE of Mean	49.55		
MLE of Standard Deviation	37.27		
nu star	53.03		
Approximate Chi Square Value (.05)	37.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	72.6
Adjusted Chi Square Value	35.68	95% Jackknife UCL	74.23
		95% Standard Bootstrap UCL	72.41
Anderson-Darling Test Statistic	2.656	95% Bootstrap-t UCL	160.4
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	192.1
Kolmogorov-Smirnov Test Statistic	0.343	95% Percentile Bootstrap UCL	76.52
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	90.12
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	110.6
		97.5% Chebyshev(Mean, Sd) UCL	137
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	188.9
95% Approximate Gamma UCL	70.45		
95% Adjusted Gamma UCL	73.65		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	110.6

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.0347	Minimum of Log Data	-3.361
Maximum	10	Maximum of Log Data	2.303
Mean	9.21	Mean of log Data	1.912
Median	10	SD of log Data	1.459
SD	2.553		
Coefficient of Variation	0.277		
Skewness	-3.796		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.35	Shapiro Wilk Test Statistic	0.296
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.37	95% H-UCL	77.88
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	49.67
95% Adjusted-CLT UCL (Chen-1995)	9.604	97.5% Chebyshev (MVUE) UCL	63.67
95% Modified-t UCL (Johnson-1978)	10.26	99% Chebyshev (MVUE) UCL	91.18

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.461	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.306		
MLE of Mean	9.21		
MLE of Standard Deviation	7.62		
nu star	43.82		
Approximate Chi Square Value (.05)	29.64	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.29
Adjusted Chi Square Value	28.2	95% Jackknife UCL	10.37
		95% Standard Bootstrap UCL	10.26
Anderson-Darling Test Statistic	5.258	95% Bootstrap-t UCL	10.02
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	9.859
Kolmogorov-Smirnov Test Statistic	0.533	95% Percentile Bootstrap UCL	9.927
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	9.874
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.08
		97.5% Chebyshev(Mean, Sd) UCL	13.33
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.77
95% Approximate Gamma UCL	13.62		
95% Adjusted Gamma UCL	14.31		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 95% Chebyshev (Mean, Sd) UCL	12.08

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	10
Raw Statistics		Log-transformed Statistics	
Minimum	65	Minimum of Log Data	4.174
Maximum	587.2	Maximum of Log Data	6.375
Mean	136	Mean of log Data	4.701
Median	112.2	SD of log Data	0.583
SD	129.6		
Coefficient of Variation	0.953		
Skewness	3.395		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.518	Shapiro Wilk Test Statistic	0.784
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	195	95% H-UCL	182.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	216.6
95% Adjusted-CLT UCL (Chen-1995)	222.4	97.5% Chebyshev (MVUE) UCL	254.6
95% Modified-t UCL (Johnson-1978)	199.9	99% Chebyshev (MVUE) UCL	329.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.058	Data do not follow a Discernable Distribution (0.05)	
Theta Star	66.11		
MLE of Mean	136		
MLE of Standard Deviation	94.83		
nu star	61.73		
Approximate Chi Square Value (.05)	44.66	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	191.1
Adjusted Chi Square Value	42.87	95% Jackknife UCL	195
		95% Standard Bootstrap UCL	189.9
Anderson-Darling Test Statistic	1.472	95% Bootstrap-t UCL	291.7
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	406.2
Kolmogorov-Smirnov Test Statistic	0.269	95% Percentile Bootstrap UCL	196.4
Kolmogorov-Smirnov 5% Critical Value	0.224	95% BCA Bootstrap UCL	232.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	281.9
		97.5% Chebyshev(Mean, Sd) UCL	345.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	469.1
95% Approximate Gamma UCL	188		
95% Adjusted Gamma UCL	195.9		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	281.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	12.25	Maximum of Log Data	2.506
Mean	10.17	Mean of log Data	2.318
Median	10	SD of log Data	0.0521
SD	0.578		
Coefficient of Variation	0.0568		
Skewness	3.802		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.339	Shapiro Wilk Test Statistic	0.345
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	10.44	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10.77
95% Adjusted-CLT UCL (Chen-1995)	10.57	97.5% Chebyshev (MVUE) UCL	11.03
95% Modified-t UCL (Johnson-1978)	10.46	99% Chebyshev (MVUE) UCL	11.53

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	298.2	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0341		
MLE of Mean	10.17		
MLE of Standard Deviation	0.589		
nu star	8945		
Approximate Chi Square Value (.05)	8726	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	10.42
Adjusted Chi Square Value	8700	95% Jackknife UCL	10.44
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	4.525	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.734	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.426	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.82
		97.5% Chebyshev(Mean, Sd) UCL	11.1
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11.66
95% Approximate Gamma UCL	10.43		
95% Adjusted Gamma UCL	10.46		

Potential UCL to Use		
	Use 95% Student's-t UCL	10.44
	or 95% Modified-t UCL	10.46

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	7
Raw Statistics		Log-transformed Statistics	
Minimum	8.74	Minimum of Log Data	2.168
Maximum	48.82	Maximum of Log Data	3.888
Mean	20.01	Mean of log Data	2.926
Median	20	SD of log Data	0.374
SD	8.828		
Coefficient of Variation	0.441		
Skewness	2.565		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.6	Shapiro Wilk Test Statistic	0.736
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	24.02	95% H-UCL	24.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.44
95% Adjusted-CLT UCL (Chen-1995)	25.37	97.5% Chebyshev (MVUE) UCL	32.13
95% Modified-t UCL (Johnson-1978)	24.27	99% Chebyshev (MVUE) UCL	39.38
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.912	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.384		
MLE of Mean	20.01		
MLE of Standard Deviation	8.229		
nu star	177.4		
Approximate Chi Square Value (.05)	147.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	23.76
Adjusted Chi Square Value	144.2	95% Jackknife UCL	24.02
		95% Standard Bootstrap UCL	23.57
Anderson-Darling Test Statistic	2.213	95% Bootstrap-t UCL	26.05
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	41.53
Kolmogorov-Smirnov Test Statistic	0.384	95% Percentile Bootstrap UCL	23.84
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	25.14
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	29.94
		97.5% Chebyshev(Mean, Sd) UCL	34.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	42.69
95% Approximate Gamma UCL	24.05		
95% Adjusted Gamma UCL	24.61		
Potential UCL to Use		Use 95% Student's-t UCL	24.02
		or 95% Modified-t UCL	24.27

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-235

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-235 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets
User Selected Options

From File	520-05.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Antimony was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Chromium

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	21	Minimum of Log Data	3.045
Maximum	85	Maximum of Log Data	4.443
Mean	72.54	Mean of log Data	4.211
Median	85	SD of log Data	0.46
SD	22.4		
Coefficient of Variation	0.309		
Skewness	-1.836		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.634	Shapiro Wilk Test Statistic	0.593
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	84.78	95% H-UCL	102
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	119.7
95% Adjusted-CLT UCL (Chen-1995)	79.65	97.5% Chebyshev (MVUE) UCL	139.5
95% Modified-t UCL (Johnson-1978)	84.16	99% Chebyshev (MVUE) UCL	178.2

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.132	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.13		
MLE of Mean	72.54		
MLE of Standard Deviation	32.02		
nu star	112.9		
Approximate Chi Square Value (.05)	89.37	Nonparametric Statistics	
Adjusted Level of Significance	0.0278	95% CLT UCL	83.65
Adjusted Chi Square Value	85.96	95% Jackknife UCL	84.78
		95% Standard Bootstrap UCL	82.83
Anderson-Darling Test Statistic	2.104	95% Bootstrap-t UCL	82.08
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	79.75
Kolmogorov-Smirnov Test Statistic	0.369	95% Percentile Bootstrap UCL	81.6
Kolmogorov-Smirnov 5% Critical Value	0.256	95% BCA Bootstrap UCL	80.47
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	102
		97.5% Chebyshev(Mean, Sd) UCL	114.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	139.7
95% Approximate Gamma UCL	91.63		
95% Adjusted Gamma UCL	95.26		

Potential UCL to Use		
	Use 95% Student's-t UCL	84.78
	or 95% Modified-t UCL	84.16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Neptunium-237

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Neptunium-237 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Nickel

General Statistics			
Number of Valid Observations	11	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	16.1	Minimum of Log Data	2.779
Maximum	220.4	Maximum of Log Data	5.396
Mean	80.52	Mean of log Data	4.235
Median	65	SD of log Data	0.605
SD	50.48		
Coefficient of Variation	0.627		
Skewness	2.332		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.675	Shapiro Wilk Test Statistic	0.772
Shapiro Wilk Critical Value	0.85	Shapiro Wilk Critical Value	0.85
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	108.1	95% H-UCL	129.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	148
95% Adjusted-CLT UCL (Chen-1995)	117	97.5% Chebyshev (MVUE) UCL	176.8
95% Modified-t UCL (Johnson-1978)	109.9	99% Chebyshev (MVUE) UCL	233.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.543	Data do not follow a Discernable Distribution (0.05)	
Theta Star	31.66		
MLE of Mean	80.52		
MLE of Standard Deviation	50.5		
nu star	55.95		
Approximate Chi Square Value (.05)	39.76	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0278	95% CLT UCL	105.6
Adjusted Chi Square Value	37.54	95% Jackknife UCL	108.1
		95% Standard Bootstrap UCL	104.6
Anderson-Darling Test Statistic	1.288	95% Bootstrap-t UCL	133.3
Anderson-Darling 5% Critical Value	0.733	95% Hall's Bootstrap UCL	239.1
Kolmogorov-Smirnov Test Statistic	0.331	95% Percentile Bootstrap UCL	108.8
Kolmogorov-Smirnov 5% Critical Value	0.257	95% BCA Bootstrap UCL	111.8
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	146.9
		97.5% Chebyshev(Mean, Sd) UCL	175.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	232
95% Approximate Gamma UCL	113.3		
95% Adjusted Gamma UCL	120		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	146.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

Uranium-238

General Statistics

Number of Valid Observations	11	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Uranium-238 was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	081-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics

Number of Valid Observations	26	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	5470	Minimum of Log Data	8.607
Maximum	13000	Maximum of Log Data	9.473
Mean	9120	Mean of log Data	9.108
Median	9120	SD of log Data	0.151
SD	1274		
Coefficient of Variation	0.14		
Skewness	-0.164		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.605	Shapiro Wilk Test Statistic	0.581
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9547	95% H-UCL	9621
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10308
95% Adjusted-CLT UCL (Chen-1995)	9523	97.5% Chebyshev (MVUE) UCL	10819
95% Modified-t UCL (Johnson-1978)	9546	99% Chebyshev (MVUE) UCL	11824
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	43.24	Data do not follow a Discernable Distribution (0.05)	
Theta Star	210.9		
MLE of Mean	9120		
MLE of Standard Deviation	1387		
nu star	2248		
Approximate Chi Square Value (.05)	2139	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	9531
Adjusted Chi Square Value	2132	95% Jackknife UCL	9547
		95% Standard Bootstrap UCL	9525
Anderson-Darling Test Statistic	5.483	95% Bootstrap-t UCL	9527
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	9620
Kolmogorov-Smirnov Test Statistic	0.442	95% Percentile Bootstrap UCL	9517
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	9493
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10209
		97.5% Chebyshev(Mean, Sd) UCL	10681
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11607
95% Approximate Gamma UCL	9585		
95% Adjusted Gamma UCL	9617		
Potential UCL to Use		Use 95% Student's-t UCL	9547
		or 95% Modified-t UCL	9546

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	21
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.32	Minimum of Log Data	1.844
Maximum	13.71	Maximum of Log Data	2.618
Mean	10.4	Mean of log Data	2.32
Median	10.4	SD of log Data	0.218
SD	2.108		
Coefficient of Variation	0.203		
Skewness	-0.316		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.947	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.11	95% H-UCL	11.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.37
95% Adjusted-CLT UCL (Chen-1995)	11.05	97.5% Chebyshev (MVUE) UCL	13.22
95% Modified-t UCL (Johnson-1978)	11.1	99% Chebyshev (MVUE) UCL	14.88
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	20.57	Data appear Normal at 5% Significance Level	
Theta Star	0.506		
MLE of Mean	10.4		
MLE of Standard Deviation	2.293		
nu star	1070		
Approximate Chi Square Value (.05)	994.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	11.08
Adjusted Chi Square Value	989.9	95% Jackknife UCL	11.11
		95% Standard Bootstrap UCL	11.06
Anderson-Darling Test Statistic	0.607	95% Bootstrap-t UCL	11.11
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	11.05
Kolmogorov-Smirnov Test Statistic	0.159	95% Percentile Bootstrap UCL	11.06
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	11.01
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12.2
		97.5% Chebyshev(Mean, Sd) UCL	12.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.51
95% Approximate Gamma UCL	11.18		
95% Adjusted Gamma UCL	11.24		
Potential UCL to Use		Use 95% Student's-t UCL	11.11

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	7
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.5	Minimum of Log Data	-0.693
Maximum	1	Maximum of Log Data	0
Mean	0.669	Mean of log Data	-0.41
Median	0.669	SD of log Data	0.126
SD	0.0882		
Coefficient of Variation	0.132		
Skewness	1.628		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.606	Shapiro Wilk Test Statistic	0.637
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.698	95% H-UCL	0.698
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.741
95% Adjusted-CLT UCL (Chen-1995)	0.703	97.5% Chebyshev (MVUE) UCL	0.772
95% Modified-t UCL (Johnson-1978)	0.699	99% Chebyshev (MVUE) UCL	0.833
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	56.9	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0117		
MLE of Mean	0.669		
MLE of Standard Deviation	0.0886		
nu star	2959		
Approximate Chi Square Value (.05)	2834	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.697
Adjusted Chi Square Value	2825	95% Jackknife UCL	0.698
		95% Standard Bootstrap UCL	0.697
Anderson-Darling Test Statistic	4.858	95% Bootstrap-t UCL	0.703
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	0.746
Kolmogorov-Smirnov Test Statistic	0.401	95% Percentile Bootstrap UCL	0.697
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	0.703
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.744
		97.5% Chebyshev(Mean, Sd) UCL	0.777
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.841
95% Approximate Gamma UCL	0.698		
95% Adjusted Gamma UCL	0.7		
Potential UCL to Use		Use 95% Student's-t UCL	0.698
		or 95% Modified-t UCL	0.699

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	18
Raw Statistics		Log-transformed Statistics	
Minimum	14	Minimum of Log Data	2.639
Maximum	108.1	Maximum of Log Data	4.683
Mean	55.83	Mean of log Data	3.923
Median	51.17	SD of log Data	0.482
SD	23.79		
Coefficient of Variation	0.426		
Skewness	0.402		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Test Statistic	0.908
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.8	95% H-UCL	68.52
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	80.69
95% Adjusted-CLT UCL (Chen-1995)	63.9	97.5% Chebyshev (MVUE) UCL	91.17
95% Modified-t UCL (Johnson-1978)	63.86	99% Chebyshev (MVUE) UCL	111.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.602	Data appear Normal at 5% Significance Level	
Theta Star	12.13		
MLE of Mean	55.83		
MLE of Standard Deviation	26.02		
nu star	239.3		
Approximate Chi Square Value (.05)	204.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	63.5
Adjusted Chi Square Value	202.4	95% Jackknife UCL	63.8
		95% Standard Bootstrap UCL	63.07
Anderson-Darling Test Statistic	0.742	95% Bootstrap-t UCL	64.49
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	64.01
Kolmogorov-Smirnov Test Statistic	0.148	95% Percentile Bootstrap UCL	63.3
Kolmogorov-Smirnov 5% Critical Value	0.172	95% BCA Bootstrap UCL	63.89
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	76.16
		97.5% Chebyshev(Mean, Sd) UCL	84.96
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	102.2
95% Approximate Gamma UCL	65.33		
95% Adjusted Gamma UCL	66.02		
Potential UCL to Use		Use 95% Student's-t UCL	63.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Cobalt

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	6.3	Minimum of Log Data	1.841
Maximum	48.3	Maximum of Log Data	3.877
Mean	13.26	Mean of log Data	2.498
Median	13.26	SD of log Data	0.383
SD	7.585		
Coefficient of Variation	0.572		
Skewness	4.144		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.434	Shapiro Wilk Test Statistic	0.655
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	15.8	95% H-UCL	15.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17.43
95% Adjusted-CLT UCL (Chen-1995)	17	97.5% Chebyshev (MVUE) UCL	19.32
95% Modified-t UCL (Johnson-1978)	16	99% Chebyshev (MVUE) UCL	23.05
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.292	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2.505		
MLE of Mean	13.26		
MLE of Standard Deviation	5.763		
nu star	275.2		
Approximate Chi Square Value (.05)	237.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	15.7
Adjusted Chi Square Value	235.5	95% Jackknife UCL	15.8
		95% Standard Bootstrap UCL	15.71
Anderson-Darling Test Statistic	4.264	95% Bootstrap-t UCL	18.56
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	26.3
Kolmogorov-Smirnov Test Statistic	0.407	95% Percentile Bootstrap UCL	15.91
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	17.95
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19.74
		97.5% Chebyshev(Mean, Sd) UCL	22.55
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	28.06
95% Approximate Gamma UCL	15.34		
95% Adjusted Gamma UCL	15.49		
Potential UCL to Use		Use 95% Student's-t UCL	15.8
		or 95% Modified-t UCL	16

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	23
Raw Statistics		Log-transformed Statistics	
Minimum	122	Minimum of Log Data	4.804
Maximum	3650	Maximum of Log Data	8.202
Mean	907.4	Mean of log Data	6.63
Median	740.4	SD of log Data	0.613
SD	662.2		
Coefficient of Variation	0.73		
Skewness	3.033		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.7	Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1129	95% H-UCL	1177
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1410
95% Adjusted-CLT UCL (Chen-1995)	1204	97.5% Chebyshev (MVUE) UCL	1628
95% Modified-t UCL (Johnson-1978)	1142	99% Chebyshev (MVUE) UCL	2055
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.615	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	347		
MLE of Mean	907.4		
MLE of Standard Deviation	561.2		
nu star	136		
Approximate Chi Square Value (.05)	110	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	1121
Adjusted Chi Square Value	108.5	95% Jackknife UCL	1129
		95% Standard Bootstrap UCL	1120
Anderson-Darling Test Statistic	0.792	95% Bootstrap-t UCL	1277
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	2075
Kolmogorov-Smirnov Test Statistic	0.153	95% Percentile Bootstrap UCL	1133
Kolmogorov-Smirnov 5% Critical Value	0.172	95% BCA Bootstrap UCL	1228
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1474
		97.5% Chebyshev(Mean, Sd) UCL	1718
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2200
95% Approximate Gamma UCL	1121		
95% Adjusted Gamma UCL	1137		
Potential UCL to Use		Use 95% Approximate Gamma UCL	1121

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0081	Minimum of Log Data	-4.816
Maximum	10	Maximum of Log Data	2.303
Mean	6.635	Mean of log Data	0.617
Median	9.165	SD of log Data	2.683
SD	4.269		
Coefficient of Variation	0.643		
Skewness	-0.842		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.707	Shapiro Wilk Test Statistic	0.635
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.065	95% H-UCL	1077
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	168.6
95% Adjusted-CLT UCL (Chen-1995)	7.865	97.5% Chebyshev (MVUE) UCL	223.5
95% Modified-t UCL (Johnson-1978)	8.042	99% Chebyshev (MVUE) UCL	331.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.467	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.22		
MLE of Mean	6.635		
MLE of Standard Deviation	9.715		
nu star	24.26		
Approximate Chi Square Value (.05)	14.05	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	8.012
Adjusted Chi Square Value	13.53	95% Jackknife UCL	8.065
		95% Standard Bootstrap UCL	7.972
Anderson-Darling Test Statistic	4.984	95% Bootstrap-t UCL	7.933
Anderson-Darling 5% Critical Value	0.809	95% Hall's Bootstrap UCL	7.835
Kolmogorov-Smirnov Test Statistic	0.414	95% Percentile Bootstrap UCL	7.97
Kolmogorov-Smirnov 5% Critical Value	0.181	95% BCA Bootstrap UCL	7.882
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.28
		97.5% Chebyshev(Mean, Sd) UCL	11.86
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.96
95% Approximate Gamma UCL	11.46		
95% Adjusted Gamma UCL	11.89		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	14.96
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	9.5	Minimum of Log Data	2.251
Maximum	114.2	Maximum of Log Data	4.738
Mean	51.84	Mean of log Data	3.727
Median	65	SD of log Data	0.782
SD	27.06		
Coefficient of Variation	0.522		
Skewness	-0.261		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.837	Shapiro Wilk Test Statistic	0.746
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	60.9	95% H-UCL	80.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	96.23
95% Adjusted-CLT UCL (Chen-1995)	60.28	97.5% Chebyshev (MVUE) UCL	113.8
95% Modified-t UCL (Johnson-1978)	60.86	99% Chebyshev (MVUE) UCL	148.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.158	Data do not follow a Discernable Distribution (0.05)	
Theta Star	24.02		
MLE of Mean	51.84		
MLE of Standard Deviation	35.29		
nu star	112.2		
Approximate Chi Square Value (.05)	88.76	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	60.57
Adjusted Chi Square Value	87.38	95% Jackknife UCL	60.9
		95% Standard Bootstrap UCL	60.34
Anderson-Darling Test Statistic	2.972	95% Bootstrap-t UCL	60.57
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	60.56
Kolmogorov-Smirnov Test Statistic	0.316	95% Percentile Bootstrap UCL	60.42
Kolmogorov-Smirnov 5% Critical Value	0.173	95% BCA Bootstrap UCL	60.23
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	74.97
		97.5% Chebyshev(Mean, Sd) UCL	84.98
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	104.6
95% Approximate Gamma UCL	65.53		
95% Adjusted Gamma UCL	66.57		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	74.97

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	20
Raw Statistics		Log-transformed Statistics	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	370	Maximum of Log Data	5.914
Mean	19.22	Mean of log Data	-0.0139
Median	0.425	SD of log Data	2.535
SD	71.97		
Coefficient of Variation	3.745		
Skewness	5.003		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.272	Shapiro Wilk Test Statistic	0.941
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	43.33	95% H-UCL	293.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	63.32
95% Adjusted-CLT UCL (Chen-1995)	57.23	97.5% Chebyshev (MVUE) UCL	83.63
95% Modified-t UCL (Johnson-1978)	45.64	99% Chebyshev (MVUE) UCL	123.5
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.239	Data appear Lognormal at 5% Significance Level	
Theta Star	80.57		
MLE of Mean	19.22		
MLE of Standard Deviation	39.35		
nu star	12.4		
Approximate Chi Square Value (.05)	5.494	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	42.44
Adjusted Chi Square Value	5.192	95% Jackknife UCL	43.33
		95% Standard Bootstrap UCL	42.37
Anderson-Darling Test Statistic	2.247	95% Bootstrap-t UCL	186.2
Anderson-Darling 5% Critical Value	0.877	95% Hall's Bootstrap UCL	132.5
Kolmogorov-Smirnov Test Statistic	0.226	95% Percentile Bootstrap UCL	46.86
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	63.85
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.74
		97.5% Chebyshev(Mean, Sd) UCL	107.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	159.7
95% Approximate Gamma UCL	43.39		
95% Adjusted Gamma UCL	45.91		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	159.7

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.032	Minimum of Log Data	-3.442
Maximum	10	Maximum of Log Data	2.303
Mean	7.053	Mean of log Data	1.05
Median	10	SD of log Data	2.235
SD	4.09		
Coefficient of Variation	0.58		
Skewness	-0.973		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.692	Shapiro Wilk Test Statistic	0.574
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	8.423	95% H-UCL	247.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	93.12
95% Adjusted-CLT UCL (Chen-1995)	8.209	97.5% Chebyshev (MVUE) UCL	122
95% Modified-t UCL (Johnson-1978)	8.398	99% Chebyshev (MVUE) UCL	178.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.62	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.37		
MLE of Mean	7.053		
MLE of Standard Deviation	8.954		
nu star	32.27		
Approximate Chi Square Value (.05)	20.28	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	8.372
Adjusted Chi Square Value	19.65	95% Jackknife UCL	8.423
		95% Standard Bootstrap UCL	8.319
Anderson-Darling Test Statistic	5.164	95% Bootstrap-t UCL	8.306
Anderson-Darling 5% Critical Value	0.792	95% Hall's Bootstrap UCL	8.211
Kolmogorov-Smirnov Test Statistic	0.39	95% Percentile Bootstrap UCL	8.332
Kolmogorov-Smirnov 5% Critical Value	0.179	95% BCA Bootstrap UCL	8.214
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.55
		97.5% Chebyshev(Mean, Sd) UCL	12.06
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.03
95% Approximate Gamma UCL	11.22		
95% Adjusted Gamma UCL	11.58		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	12.06
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Thallium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	0.11	Minimum of Log Data	-2.207
Maximum	0.8	Maximum of Log Data	-0.223
Mean	0.31	Mean of log Data	-1.224
Median	0.31	SD of log Data	0.328
SD	0.116		
Coefficient of Variation	0.373		
Skewness	2.968		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.572	Shapiro Wilk Test Statistic	0.697
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.349	95% H-UCL	0.35
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.398
95% Adjusted-CLT UCL (Chen-1995)	0.361	97.5% Chebyshev (MVUE) UCL	0.436
95% Modified-t UCL (Johnson-1978)	0.351	99% Chebyshev (MVUE) UCL	0.511
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.543	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0363		
MLE of Mean	0.31		
MLE of Standard Deviation	0.106		
nu star	444.2		
Approximate Chi Square Value (.05)	396.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.347
Adjusted Chi Square Value	393.4	95% Jackknife UCL	0.349
		95% Standard Bootstrap UCL	0.347
Anderson-Darling Test Statistic	4.035	95% Bootstrap-t UCL	0.369
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	0.547
Kolmogorov-Smirnov Test Statistic	0.38	95% Percentile Bootstrap UCL	0.35
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	0.363
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.409
		97.5% Chebyshev(Mean, Sd) UCL	0.452
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.536
95% Approximate Gamma UCL	0.347		
95% Adjusted Gamma UCL	0.35		
Potential UCL to Use		Use 95% Student's-t UCL	0.349
		or 95% Modified-t UCL	0.351

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.0073	Minimum of Log Data	-4.92
Maximum	0.779	Maximum of Log Data	-0.25
Mean	0.401	Mean of log Data	-1.04
Median	0.401	SD of log Data	0.802
SD	0.109		
Coefficient of Variation	0.272		
Skewness	-0.244		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.4	Shapiro Wilk Test Statistic	0.267
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.438	95% H-UCL	0.701
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.84
95% Adjusted-CLT UCL (Chen-1995)	0.435	97.5% Chebyshev (MVUE) UCL	0.997
95% Modified-t UCL (Johnson-1978)	0.438	99% Chebyshev (MVUE) UCL	1.303
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.648	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.11		
MLE of Mean	0.401		
MLE of Standard Deviation	0.21		
nu star	189.7		
Approximate Chi Square Value (.05)	158.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.436
Adjusted Chi Square Value	157	95% Jackknife UCL	0.438
		95% Standard Bootstrap UCL	0.436
Anderson-Darling Test Statistic	8.335	95% Bootstrap-t UCL	0.432
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	0.443
Kolmogorov-Smirnov Test Statistic	0.525	95% Percentile Bootstrap UCL	0.431
Kolmogorov-Smirnov 5% Critical Value	0.172	95% BCA Bootstrap UCL	0.431
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.495
		97.5% Chebyshev(Mean, Sd) UCL	0.535
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.614
95% Approximate Gamma UCL	0.479		
95% Adjusted Gamma UCL	0.485		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.495

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	21
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.5	Minimum of Log Data	0.405
Maximum	6500	Maximum of Log Data	8.78
Mean	2646	Mean of log Data	6.11
Median	3050	SD of log Data	3.086
SD	2143		
Coefficient of Variation	0.81		
Skewness	-0.111		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.859	Shapiro Wilk Test Statistic	0.723
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	3363	95% H-UCL	1939952
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	109838
95% Adjusted-CLT UCL (Chen-1995)	3327	97.5% Chebyshev (MVUE) UCL	146564
95% Modified-t UCL (Johnson-1978)	3362	99% Chebyshev (MVUE) UCL	218704
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.358	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7394		
MLE of Mean	2646		
MLE of Standard Deviation	4423		
nu star	18.61		
Approximate Chi Square Value (.05)	9.83	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	3337
Adjusted Chi Square Value	9.409	95% Jackknife UCL	3363
		95% Standard Bootstrap UCL	3325
Anderson-Darling Test Statistic	3.512	95% Bootstrap-t UCL	3321
Anderson-Darling 5% Critical Value	0.835	95% Hall's Bootstrap UCL	3316
Kolmogorov-Smirnov Test Statistic	0.357	95% Percentile Bootstrap UCL	3319
Kolmogorov-Smirnov 5% Critical Value	0.184	95% BCA Bootstrap UCL	3327
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4477
		97.5% Chebyshev(Mean, Sd) UCL	5270
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6827
95% Approximate Gamma UCL	5008		
95% Adjusted Gamma UCL	5232		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	6827
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.82	Minimum of Log Data	0.599
Maximum	2.67	Maximum of Log Data	0.982
Mean	2.245	Mean of log Data	0.807
Median	2.245	SD of log Data	0.0544
SD	0.12		
Coefficient of Variation	0.0535		
Skewness	2.1E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Test Statistic	0.385
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.285	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.35
95% Adjusted-CLT UCL (Chen-1995)	2.284	97.5% Chebyshev (MVUE) UCL	2.395
95% Modified-t UCL (Johnson-1978)	2.285	99% Chebyshev (MVUE) UCL	2.484
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	315.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00712		
MLE of Mean	2.245		
MLE of Standard Deviation	0.126		
nu star	16394		
Approximate Chi Square Value (.05)	16098	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	2.284
Adjusted Chi Square Value	16078	95% Jackknife UCL	2.285
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	7.951	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.469	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.348
		97.5% Chebyshev(Mean, Sd) UCL	2.392
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.48
95% Approximate Gamma UCL	2.286		
95% Adjusted Gamma UCL	2.289		
Potential UCL to Use		Use 95% Student's-t UCL	2.285
		or 95% Modified-t UCL	2.285

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	081-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	5470	Minimum of Log Data	8.607
Maximum	13000	Maximum of Log Data	9.473
Mean	9217	Mean of log Data	9.122
Median	9217	SD of log Data	0.125
SD	1065		
Coefficient of Variation	0.116		
Skewness	0.0559		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.391	Shapiro Wilk Test Statistic	0.376
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9573	95% H-UCL	9629
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10208
95% Adjusted-CLT UCL (Chen-1995)	9563	97.5% Chebyshev (MVUE) UCL	10634
95% Modified-t UCL (Johnson-1978)	9574	99% Chebyshev (MVUE) UCL	11473
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	63.43	Data do not follow a Discernable Distribution (0.05)	
Theta Star	145.3		
MLE of Mean	9217		
MLE of Standard Deviation	1157		
nu star	3299		
Approximate Chi Square Value (.05)	3166	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	9560
Adjusted Chi Square Value	3158	95% Jackknife UCL	9573
		95% Standard Bootstrap UCL	9559
Anderson-Darling Test Statistic	7.921	95% Bootstrap-t UCL	9521
Anderson-Darling 5% Critical Value	0.743	95% Hall's Bootstrap UCL	9657
Kolmogorov-Smirnov Test Statistic	0.464	95% Percentile Bootstrap UCL	9508
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	9508
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10127
		97.5% Chebyshev(Mean, Sd) UCL	10521
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	11295
95% Approximate Gamma UCL	9602		
95% Adjusted Gamma UCL	9628		
Potential UCL to Use		Use 95% Student's-t UCL	9573
		or 95% Modified-t UCL	9574

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Arsenic

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	5.81	Minimum of Log Data	1.76
Maximum	13.71	Maximum of Log Data	2.618
Mean	9.601	Mean of log Data	2.241
Median	9.601	SD of log Data	0.212
SD	1.932		
Coefficient of Variation	0.201		
Skewness	-0.0284		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.951	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	10.25	95% H-UCL	10.36
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.36
95% Adjusted-CLT UCL (Chen-1995)	10.22	97.5% Chebyshev (MVUE) UCL	12.12
95% Modified-t UCL (Johnson-1978)	10.25	99% Chebyshev (MVUE) UCL	13.61
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	21.52	Data appear Normal at 5% Significance Level	
Theta Star	0.446		
MLE of Mean	9.601		
MLE of Standard Deviation	2.07		
nu star	1119		
Approximate Chi Square Value (.05)	1042	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	10.22
Adjusted Chi Square Value	1038	95% Jackknife UCL	10.25
		95% Standard Bootstrap UCL	10.21
Anderson-Darling Test Statistic	0.672	95% Bootstrap-t UCL	10.24
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	10.23
Kolmogorov-Smirnov Test Statistic	0.181	95% Percentile Bootstrap UCL	10.21
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	10.19
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.25
		97.5% Chebyshev(Mean, Sd) UCL	11.97
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.37
95% Approximate Gamma UCL	10.31		
95% Adjusted Gamma UCL	10.36		

Potential UCL to Use		Use 95% Student's-t UCL	10.25

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Beryllium

General Statistics

Number of Valid Observations	26	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.5	Minimum of Log Data	-0.693
Maximum	1	Maximum of Log Data	0
Mean	0.733	Mean of log Data	-0.315
Median	0.733	SD of log Data	0.0989
SD	0.0712		
Coefficient of Variation	0.0971		
Skewness	0.748		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.419	Shapiro Wilk Test Statistic	0.418
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.757	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.796
95% Adjusted-CLT UCL (Chen-1995)	0.758	97.5% Chebyshev (MVUE) UCL	0.822
95% Modified-t UCL (Johnson-1978)	0.758	99% Chebyshev (MVUE) UCL	0.875
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	96.52	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0076		
MLE of Mean	0.733		
MLE of Standard Deviation	0.0746		
nu star	5019		
Approximate Chi Square Value (.05)	4855	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.756
Adjusted Chi Square Value	4845	95% Jackknife UCL	0.757
		95% Standard Bootstrap UCL	0.756
Anderson-Darling Test Statistic	7.399	95% Bootstrap-t UCL	0.756
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.772
Kolmogorov-Smirnov Test Statistic	0.449	95% Percentile Bootstrap UCL	0.754
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	0.755
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.794
		97.5% Chebyshev(Mean, Sd) UCL	0.821
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.872
95% Approximate Gamma UCL	0.758		
95% Adjusted Gamma UCL	0.76		
Potential UCL to Use		Use 95% Student's-t UCL	0.757
		or 95% Modified-t UCL	0.758

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	12
Raw Statistics		Log-transformed Statistics	
Minimum	12.2	Minimum of Log Data	2.501
Maximum	108.1	Maximum of Log Data	4.683
Mean	64.42	Mean of log Data	4.05
Median	64.42	SD of log Data	0.559
SD	25.48		
Coefficient of Variation	0.395		
Skewness	-0.561		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.785
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	72.95	95% H-UCL	84.03
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	100.1
95% Adjusted-CLT UCL (Chen-1995)	72.05	97.5% Chebyshev (MVUE) UCL	114.5
95% Modified-t UCL (Johnson-1978)	72.86	99% Chebyshev (MVUE) UCL	143
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	3.995	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.13		
MLE of Mean	64.42		
MLE of Standard Deviation	32.23		
nu star	207.7		
Approximate Chi Square Value (.05)	175.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	72.64
Adjusted Chi Square Value	173.4	95% Jackknife UCL	72.95
		95% Standard Bootstrap UCL	72.75
Anderson-Darling Test Statistic	1.732	95% Bootstrap-t UCL	72.84
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	71.91
Kolmogorov-Smirnov Test Statistic	0.241	95% Percentile Bootstrap UCL	72.26
Kolmogorov-Smirnov 5% Critical Value	0.172	95% BCA Bootstrap UCL	72.04
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	86.2
		97.5% Chebyshev(Mean, Sd) UCL	95.62
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	114.1
95% Approximate Gamma UCL	76.3		
95% Adjusted Gamma UCL	77.16		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	86.2

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0375	Minimum of Log Data	-3.283
Maximum	10	Maximum of Log Data	2.303
Mean	8.503	Mean of log Data	1.695
Median	10	SD of log Data	1.602
SD	3.169		
Coefficient of Variation	0.373		
Skewness	-2.365		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.506	Shapiro Wilk Test Statistic	0.418
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.565	95% H-UCL	57.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	48.44
95% Adjusted-CLT UCL (Chen-1995)	9.217	97.5% Chebyshev (MVUE) UCL	61.7
95% Modified-t UCL (Johnson-1978)	9.517	99% Chebyshev (MVUE) UCL	87.75
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.144	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.435		
MLE of Mean	8.503		
MLE of Standard Deviation	7.951		
nu star	59.47		
Approximate Chi Square Value (.05)	42.74	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	9.525
Adjusted Chi Square Value	41.8	95% Jackknife UCL	9.565
		95% Standard Bootstrap UCL	9.498
Anderson-Darling Test Statistic	7.634	95% Bootstrap-t UCL	9.379
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	9.29
Kolmogorov-Smirnov Test Statistic	0.494	95% Percentile Bootstrap UCL	9.389
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	9.265
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.21
		97.5% Chebyshev(Mean, Sd) UCL	12.38
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.69
95% Approximate Gamma UCL	11.83		
95% Adjusted Gamma UCL	12.1		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 95% Chebyshev (Mean, Sd) UCL	11.21

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	8
Raw Statistics		Log-transformed Statistics	
Minimum	9.5	Minimum of Log Data	2.251
Maximum	81.89	Maximum of Log Data	4.405
Mean	58.15	Mean of log Data	3.972
Median	65	SD of log Data	0.532
SD	17.22		
Coefficient of Variation	0.296		
Skewness	-2.194		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.582	Shapiro Wilk Test Statistic	0.492
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	63.92	95% H-UCL	75.61
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	89.74
95% Adjusted-CLT UCL (Chen-1995)	62.15	97.5% Chebyshev (MVUE) UCL	102.3
95% Modified-t UCL (Johnson-1978)	63.68	99% Chebyshev (MVUE) UCL	126.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.002	Data do not follow a Discernable Distribution (0.05)	
Theta Star	11.63		
MLE of Mean	58.15		
MLE of Standard Deviation	26		
nu star	260.1		
Approximate Chi Square Value (.05)	223.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	63.71
Adjusted Chi Square Value	221.5	95% Jackknife UCL	63.92
		95% Standard Bootstrap UCL	63.54
Anderson-Darling Test Statistic	6.076	95% Bootstrap-t UCL	63.03
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	62.41
Kolmogorov-Smirnov Test Statistic	0.441	95% Percentile Bootstrap UCL	63.35
Kolmogorov-Smirnov 5% Critical Value	0.172	95% BCA Bootstrap UCL	62.42
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	72.87
		97.5% Chebyshev(Mean, Sd) UCL	79.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	91.75
95% Approximate Gamma UCL	67.6		
95% Adjusted Gamma UCL	68.27		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	72.87

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	20
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.015	Minimum of Log Data	-4.2
Maximum	370	Maximum of Log Data	5.914
Mean	19.39	Mean of log Data	-0.0385
Median	0.425	SD of log Data	2.627
SD	71.94		
Coefficient of Variation	3.711		
Skewness	5.002		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.274	Shapiro Wilk Test Statistic	0.94
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	43.49	95% H-UCL	432.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	76.66
95% Adjusted-CLT UCL (Chen-1995)	57.38	97.5% Chebyshev (MVUE) UCL	101.5
95% Modified-t UCL (Johnson-1978)	45.79	99% Chebyshev (MVUE) UCL	150.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.236	Data appear Lognormal at 5% Significance Level	
Theta Star	81.97		
MLE of Mean	19.39		
MLE of Standard Deviation	39.86		
nu star	12.3		
Approximate Chi Square Value (.05)	5.424	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	42.59
Adjusted Chi Square Value	5.124	95% Jackknife UCL	43.49
		95% Standard Bootstrap UCL	42.85
Anderson-Darling Test Statistic	2.014	95% Bootstrap-t UCL	184.9
Anderson-Darling 5% Critical Value	0.878	95% Hall's Bootstrap UCL	132.3
Kolmogorov-Smirnov Test Statistic	0.224	95% Percentile Bootstrap UCL	46.86
Kolmogorov-Smirnov 5% Critical Value	0.188	95% BCA Bootstrap UCL	62.64
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	80.88
		97.5% Chebyshev(Mean, Sd) UCL	107.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	159.8
95% Approximate Gamma UCL	43.95		
95% Adjusted Gamma UCL	46.53		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	159.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	5
Raw Statistics		Log-transformed Statistics	
Minimum	0.032	Minimum of Log Data	-3.442
Maximum	10	Maximum of Log Data	2.303
Mean	8.811	Mean of log Data	1.95
Median	10	SD of log Data	1.162
SD	2.7		
Coefficient of Variation	0.306		
Skewness	-2.533		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.498	Shapiro Wilk Test Statistic	0.345
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.716	95% H-UCL	25.99
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	28.7
95% Adjusted-CLT UCL (Chen-1995)	9.401	97.5% Chebyshev (MVUE) UCL	35.39
95% Modified-t UCL (Johnson-1978)	9.672	99% Chebyshev (MVUE) UCL	48.52
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.122	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.152		
MLE of Mean	8.811		
MLE of Standard Deviation	6.049		
nu star	110.3		
Approximate Chi Square Value (.05)	87.09	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	9.682
Adjusted Chi Square Value	85.73	95% Jackknife UCL	9.716
		95% Standard Bootstrap UCL	9.675
Anderson-Darling Test Statistic	6.867	95% Bootstrap-t UCL	9.514
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	9.462
Kolmogorov-Smirnov Test Statistic	0.471	95% Percentile Bootstrap UCL	9.612
Kolmogorov-Smirnov 5% Critical Value	0.173	95% BCA Bootstrap UCL	9.434
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.12
		97.5% Chebyshev(Mean, Sd) UCL	12.12
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.08
95% Approximate Gamma UCL	11.16		
95% Adjusted Gamma UCL	11.34		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.12
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	4
Raw Statistics		Log-transformed Statistics	
Minimum	0.4	Minimum of Log Data	-0.916
Maximum	0.779	Maximum of Log Data	-0.25
Mean	0.533	Mean of log Data	-0.635
Median	0.533	SD of log Data	0.106
SD	0.0603		
Coefficient of Variation	0.113		
Skewness	2.189		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.446	Shapiro Wilk Test Statistic	0.475
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.553	95% H-UCL	0.553
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.581
95% Adjusted-CLT UCL (Chen-1995)	0.558	97.5% Chebyshev (MVUE) UCL	0.602
95% Modified-t UCL (Johnson-1978)	0.554	99% Chebyshev (MVUE) UCL	0.643
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	79.12	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00674		
MLE of Mean	0.533		
MLE of Standard Deviation	0.0599		
nu star	4114		
Approximate Chi Square Value (.05)	3966	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.552
Adjusted Chi Square Value	3956	95% Jackknife UCL	0.553
		95% Standard Bootstrap UCL	0.552
Anderson-Darling Test Statistic	6.946	95% Bootstrap-t UCL	0.558
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	0.668
Kolmogorov-Smirnov Test Statistic	0.447	95% Percentile Bootstrap UCL	0.552
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	0.556
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.584
		97.5% Chebyshev(Mean, Sd) UCL	0.607
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.651
95% Approximate Gamma UCL	0.553		
95% Adjusted Gamma UCL	0.554		
Potential UCL to Use		Use 95% Student's-t UCL	0.553
		or 95% Modified-t UCL	0.554

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	17
Raw Statistics		Log-transformed Statistics	
Minimum	7.98	Minimum of Log Data	2.077
Maximum	6500	Maximum of Log Data	8.78
Mean	2762	Mean of log Data	6.569
Median	3050	SD of log Data	2.599
SD	2071		
Coefficient of Variation	0.75		
Skewness	-0.212		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.871	Shapiro Wilk Test Statistic	0.68
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	3456	95% H-UCL	281962
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	53125
95% Adjusted-CLT UCL (Chen-1995)	3413	97.5% Chebyshev (MVUE) UCL	70274
95% Modified-t UCL (Johnson-1978)	3454	99% Chebyshev (MVUE) UCL	103958
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.444	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6222		
MLE of Mean	2762		
MLE of Standard Deviation	4146		
nu star	23.09		
Approximate Chi Square Value (.05)	13.16	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	3431
Adjusted Chi Square Value	12.66	95% Jackknife UCL	3456
		95% Standard Bootstrap UCL	3410
Anderson-Darling Test Statistic	3.812	95% Bootstrap-t UCL	3435
Anderson-Darling 5% Critical Value	0.814	95% Hall's Bootstrap UCL	3426
Kolmogorov-Smirnov Test Statistic	0.365	95% Percentile Bootstrap UCL	3417
Kolmogorov-Smirnov 5% Critical Value	0.182	95% BCA Bootstrap UCL	3426
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4533
		97.5% Chebyshev(Mean, Sd) UCL	5299
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	6804
95% Approximate Gamma UCL	4848		
95% Adjusted Gamma UCL	5037		
Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	6804
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Uranium-238

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	1.82	Minimum of Log Data	0.599
Maximum	2.67	Maximum of Log Data	0.982
Mean	2.245	Mean of log Data	0.807
Median	2.245	SD of log Data	0.0544
SD	0.12		
Coefficient of Variation	0.0535		
Skewness	2.08E-14		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Test Statistic	0.385
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.285	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.35
95% Adjusted-CLT UCL (Chen-1995)	2.284	97.5% Chebyshev (MVUE) UCL	2.395
95% Modified-t UCL (Johnson-1978)	2.285	99% Chebyshev (MVUE) UCL	2.484
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	315.3	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.00712		
MLE of Mean	2.245		
MLE of Standard Deviation	0.126		
nu star	16394		
Approximate Chi Square Value (.05)	16098	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	2.284
Adjusted Chi Square Value	16078	95% Jackknife UCL	2.285
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	7.951	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.469	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.348
		97.5% Chebyshev(Mean, Sd) UCL	2.392
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.48
95% Approximate Gamma UCL	2.286		
95% Adjusted Gamma UCL	2.289		
Potential UCL to Use		Use 95% Student's-t UCL	2.285
		or 95% Modified-t UCL	2.285

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options

From File	153-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	10	Number of Distinct Observations	9

Raw Statistics		Log-transformed Statistics	
Minimum	5.82	Minimum of Log Data	1.761
Maximum	11	Maximum of Log Data	2.398
Mean	8.921	Mean of log Data	2.17
Median	8.945	SD of log Data	0.21
SD	1.719		
Coefficient of Variation	0.193		
Skewness	-0.652		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.912	Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.918	95% H-UCL	10.21
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.52
95% Adjusted-CLT UCL (Chen-1995)	9.696	97.5% Chebyshev (MVUE) UCL	12.64
95% Modified-t UCL (Johnson-1978)	9.899	99% Chebyshev (MVUE) UCL	14.85

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	18.93	Data appear Normal at 5% Significance Level	
Theta Star	0.471		
MLE of Mean	8.921		
MLE of Standard Deviation	2.05		
nu star	378.7		
Approximate Chi Square Value (.05)	334.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	9.815
Adjusted Chi Square Value	327.4	95% Jackknife UCL	9.918
		95% Standard Bootstrap UCL	9.746
Anderson-Darling Test Statistic	0.519	95% Bootstrap-t UCL	9.834
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	9.707
Kolmogorov-Smirnov Test Statistic	0.243	95% Percentile Bootstrap UCL	9.758
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	9.693
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.29
		97.5% Chebyshev(Mean, Sd) UCL	12.32
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.33
95% Approximate Gamma UCL	10.1		
95% Adjusted Gamma UCL	10.32		

Potential UCL to Use		Use 95% Student's-t UCL	9.918

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	8
Raw Statistics		**Log-transformed Statistics**	
Minimum	41.27	Minimum of Log Data	3.72
Maximum	85	Maximum of Log Data	4.443
Mean	61.95	Mean of log Data	4.086
Median	62.78	SD of log Data	0.302
SD	18.38		
Coefficient of Variation	0.297		
Skewness	0.207		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.849	Shapiro Wilk Test Statistic	0.855
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	72.61	95% H-UCL	76.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	88
95% Adjusted-CLT UCL (Chen-1995)	71.92	97.5% Chebyshev (MVUE) UCL	99.25
95% Modified-t UCL (Johnson-1978)	72.67	99% Chebyshev (MVUE) UCL	121.4
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	8.794	Data appear Normal at 5% Significance Level	
Theta Star	7.045		
MLE of Mean	61.95		
MLE of Standard Deviation	20.89		
nu star	175.9		
Approximate Chi Square Value (.05)	146.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0267	95% CLT UCL	71.51
Adjusted Chi Square Value	141.5	95% Jackknife UCL	72.61
		95% Standard Bootstrap UCL	71.14
Anderson-Darling Test Statistic	0.62	95% Bootstrap-t UCL	72.56
Anderson-Darling 5% Critical Value	0.725	95% Hall's Bootstrap UCL	70.39
Kolmogorov-Smirnov Test Statistic	0.198	95% Percentile Bootstrap UCL	71.04
Kolmogorov-Smirnov 5% Critical Value	0.267	95% BCA Bootstrap UCL	70.95
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	87.28
		97.5% Chebyshev(Mean, Sd) UCL	98.24
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	119.8
95% Approximate Gamma UCL	74.53		
95% Adjusted Gamma UCL	77		

Potential UCL to Use			
		Use 95% Student's-t UCL	72.61

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Manganese

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	10
Raw Statistics		**Log-transformed Statistics**	
Minimum	109.9	Minimum of Log Data	4.699
Maximum	1018	Maximum of Log Data	6.926
Mean	362.2	Mean of log Data	5.654
Median	322.3	SD of log Data	0.731
SD	274.1		
Coefficient of Variation	0.757		
Skewness	1.614		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.831	Shapiro Wilk Test Statistic	0.937
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	521	95% H-UCL	699.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	736.9
95% Adjusted-CLT UCL (Chen-1995)	552	97.5% Chebyshev (MVUE) UCL	899.6
95% Modified-t UCL (Johnson-1978)	528.4	99% Chebyshev (MVUE) UCL	1219
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.644	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	220.3		
MLE of Mean	362.2		
MLE of Standard Deviation	282.5		
nu star	32.87		
Approximate Chi Square Value (.05)	20.77	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0267	95% CLT UCL	504.7
Adjusted Chi Square Value	19.11	95% Jackknife UCL	521
		95% Standard Bootstrap UCL	497.6
Anderson-Darling Test Statistic	0.35	95% Bootstrap-t UCL	603.6
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	1120
Kolmogorov-Smirnov Test Statistic	0.163	95% Percentile Bootstrap UCL	503.7
Kolmogorov-Smirnov 5% Critical Value	0.269	95% BCA Bootstrap UCL	564.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	739.9
		97.5% Chebyshev(Mean, Sd) UCL	903.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1224
95% Approximate Gamma UCL	573.3		
95% Adjusted Gamma UCL	623		
Potential UCL to Use		Use 95% Approximate Gamma UCL	573.3

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	13.2	Minimum of Log Data	2.58
Maximum	99.22	Maximum of Log Data	4.597
Mean	62.73	Mean of log Data	3.996
Median	65	SD of log Data	0.653
SD	26.91		
Coefficient of Variation	0.429		
Skewness	-0.896		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.853	Shapiro Wilk Test Statistic	0.732
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	78.33	95% H-UCL	114.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	126.4
95% Adjusted-CLT UCL (Chen-1995)	74.15	97.5% Chebyshev (MVUE) UCL	152.7
95% Modified-t UCL (Johnson-1978)	77.93	99% Chebyshev (MVUE) UCL	204.3
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.626	Data appear Normal at 5% Significance Level	
Theta Star	23.89		
MLE of Mean	62.73		
MLE of Standard Deviation	38.71		
nu star	52.52		
Approximate Chi Square Value (.05)	36.87	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0267	95% CLT UCL	76.73
Adjusted Chi Square Value	34.61	95% Jackknife UCL	78.33
		95% Standard Bootstrap UCL	76.54
Anderson-Darling Test Statistic	1.206	95% Bootstrap-t UCL	75.55
Anderson-Darling 5% Critical Value	0.73	95% Hall's Bootstrap UCL	73.9
Kolmogorov-Smirnov Test Statistic	0.396	95% Percentile Bootstrap UCL	75.18
Kolmogorov-Smirnov 5% Critical Value	0.268	95% BCA Bootstrap UCL	74.25
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	99.83
		97.5% Chebyshev(Mean, Sd) UCL	115.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	147.4
95% Approximate Gamma UCL	89.35		
95% Adjusted Gamma UCL	95.2		

Potential UCL to Use			
		Use 95% Student's-t UCL	78.33

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

PCB, Total

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	0.35	Minimum of Log Data	-1.05
Maximum	5	Maximum of Log Data	1.609
Mean	3.633	Mean of log Data	0.874
Median	5	SD of log Data	1.192
SD	2.202		
Coefficient of Variation	0.606		
Skewness	-1.038		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.603	Shapiro Wilk Test Statistic	0.625
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	4.909	95% H-UCL	19.69
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12.02
95% Adjusted-CLT UCL (Chen-1995)	4.534	97.5% Chebyshev (MVUE) UCL	15.32
95% Modified-t UCL (Johnson-1978)	4.871	99% Chebyshev (MVUE) UCL	21.8
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.007	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.608		
MLE of Mean	3.633		
MLE of Standard Deviation	3.62		
nu star	20.14		
Approximate Chi Square Value (.05)	10.95	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	4.778
Adjusted Chi Square Value	9.797	95% Jackknife UCL	4.909
		95% Standard Bootstrap UCL	4.665
Anderson-Darling Test Statistic	2.091	95% Bootstrap-t UCL	4.489
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	4.366
Kolmogorov-Smirnov Test Statistic	0.45	95% Percentile Bootstrap UCL	4.538
Kolmogorov-Smirnov 5% Critical Value	0.272	95% BCA Bootstrap UCL	4.538
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	6.668
		97.5% Chebyshev(Mean, Sd) UCL	7.982
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	10.56
95% Approximate Gamma UCL	6.679		
95% Adjusted Gamma UCL	7.468		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	6.668
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	5
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.021	Minimum of Log Data	-3.863
Maximum	13.17	Maximum of Log Data	2.578
Mean	8.562	Mean of log Data	1.167
Median	10	SD of log Data	2.529
SD	4.642		
Coefficient of Variation	0.542		
Skewness	-1.487		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.695	Shapiro Wilk Test Statistic	0.552
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	11.25	95% H-UCL	22097
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	152.4
95% Adjusted-CLT UCL (Chen-1995)	10.24	97.5% Chebyshev (MVUE) UCL	203.3
95% Modified-t UCL (Johnson-1978)	11.14	99% Chebyshev (MVUE) UCL	303.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.505	Data do not follow a Discernable Distribution (0.05)	
Theta Star	16.96		
MLE of Mean	8.562		
MLE of Standard Deviation	12.05		
nu star	10.1		
Approximate Chi Square Value (.05)	4.004	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0267	95% CLT UCL	10.98
Adjusted Chi Square Value	3.364	95% Jackknife UCL	11.25
		95% Standard Bootstrap UCL	10.81
Anderson-Darling Test Statistic	2.537	95% Bootstrap-t UCL	10.55
Anderson-Darling 5% Critical Value	0.767	95% Hall's Bootstrap UCL	10.26
Kolmogorov-Smirnov Test Statistic	0.508	95% Percentile Bootstrap UCL	10.72
Kolmogorov-Smirnov 5% Critical Value	0.278	95% BCA Bootstrap UCL	10.56
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.96
		97.5% Chebyshev(Mean, Sd) UCL	17.73
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.17
95% Approximate Gamma UCL	21.6		
95% Adjusted Gamma UCL	25.71		

Potential UCL to Use			
Recommended UCL exceeds the maximum observation		Use 99% Chebyshev (Mean, Sd) UCL	23.17

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	3
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0083	Minimum of Log Data	-4.791
Maximum	0.0869	Maximum of Log Data	-2.443
Mean	0.0476	Mean of log Data	-3.159
Median	0.0476	SD of log Data	0.604
SD	0.0185		
Coefficient of Variation	0.389		
Skewness	1.3E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.659	Shapiro Wilk Test Statistic	0.554
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0583	95% H-UCL	0.0822
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0925
95% Adjusted-CLT UCL (Chen-1995)	0.0572	97.5% Chebyshev (MVUE) UCL	0.111
95% Modified-t UCL (Johnson-1978)	0.0583	99% Chebyshev (MVUE) UCL	0.147
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.236	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0147		
MLE of Mean	0.0476		
MLE of Standard Deviation	0.0265		
nu star	64.72		
Approximate Chi Square Value (.05)	47.21	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.0572
Adjusted Chi Square Value	44.62	95% Jackknife UCL	0.0583
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.192	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.729	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.463	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.268	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0731
		97.5% Chebyshev(Mean, Sd) UCL	0.0842
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.106
95% Approximate Gamma UCL	0.0653		
95% Adjusted Gamma UCL	0.069		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	0.0731

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	153-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

PCB, Total

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	3
Raw Statistics		Log-transformed Statistics	
Minimum	0.35	Minimum of Log Data	-1.05
Maximum	0.6	Maximum of Log Data	-0.511
Mean	0.475	Mean of log Data	-0.752
Median	0.475	SD of log Data	0.128
SD	0.0589		
Coefficient of Variation	0.124		
Skewness	1.77E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.659	Shapiro Wilk Test Statistic	0.65
Shapiro Wilk Critical Value	0.842	Shapiro Wilk Critical Value	0.842
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.509	95% H-UCL	0.514
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.559
95% Adjusted-CLT UCL (Chen-1995)	0.506	97.5% Chebyshev (MVUE) UCL	0.595
95% Modified-t UCL (Johnson-1978)	0.509	99% Chebyshev (MVUE) UCL	0.667
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	48.95	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0097		
MLE of Mean	0.475		
MLE of Standard Deviation	0.0679		
nu star	979		
Approximate Chi Square Value (.05)	907.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	0.506
Adjusted Chi Square Value	895.4	95% Jackknife UCL	0.509
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	2.024	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.724	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.416	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.266	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.556
		97.5% Chebyshev(Mean, Sd) UCL	0.591
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.66
95% Approximate Gamma UCL	0.512		
95% Adjusted Gamma UCL	0.519		
Potential UCL to Use		Use 95% Student's-t UCL	0.509
		or 95% Modified-t UCL	0.509

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.
Total PAH

General Statistics			
Number of Valid Observations	10	Number of Distinct Observations	1

Warning: There is only one distinct observation value in this data set - resulting in '0' variance!
ProUCL (or any other software) should not be used on such a data set!
The data set for variable Total PAH was not processed!

If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

General UCL Statistics for Full Data Sets

User Selected Options	
From File	163-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic

General Statistics

Number of Valid Observations	26	Number of Distinct Observations	13

Raw Statistics		Log-transformed Statistics	
Minimum	5.78	Minimum of Log Data	1.754
Maximum	11	Maximum of Log Data	2.398
Mean	9.346	Mean of log Data	2.212
Median	11	SD of log Data	0.225
SD	1.95		
Coefficient of Variation	0.209		
Skewness	-0.509		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.763	Shapiro Wilk Test Statistic	0.775
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.999	95% H-UCL	10.14
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11.17
95% Adjusted-CLT UCL (Chen-1995)	9.934	97.5% Chebyshev (MVUE) UCL	11.96
95% Modified-t UCL (Johnson-1978)	9.992	99% Chebyshev (MVUE) UCL	13.5

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	19.29	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.484		
MLE of Mean	9.346		
MLE of Standard Deviation	2.128		
nu star	1003		
Approximate Chi Square Value (.05)	930.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	9.975
Adjusted Chi Square Value	926	95% Jackknife UCL	9.999
		95% Standard Bootstrap UCL	9.965
Anderson-Darling Test Statistic	2.727	95% Bootstrap-t UCL	9.973
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	9.915
Kolmogorov-Smirnov Test Statistic	0.341	95% Percentile Bootstrap UCL	9.967
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	9.897
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.01
		97.5% Chebyshev(Mean, Sd) UCL	11.73
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13.15
95% Approximate Gamma UCL	10.07		
95% Adjusted Gamma UCL	10.12		

Potential UCL to Use		
	Use 95% Student's-t UCL	9.999
	or 95% Modified-t UCL	9.992

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Chromium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	17
Raw Statistics		**Log-transformed Statistics**	
Minimum	15.9	Minimum of Log Data	2.766
Maximum	85	Maximum of Log Data	4.443
Mean	58.56	Mean of log Data	3.985
Median	50.65	SD of log Data	0.443
SD	22.9		
Coefficient of Variation	0.391		
Skewness	0.0518		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.84	Shapiro Wilk Test Statistic	0.866
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	66.23	95% H-UCL	70.28
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	82.15
95% Adjusted-CLT UCL (Chen-1995)	65.99	97.5% Chebyshev (MVUE) UCL	92.14
95% Modified-t UCL (Johnson-1978)	66.24	99% Chebyshev (MVUE) UCL	111.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.356	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.93		
MLE of Mean	58.56		
MLE of Standard Deviation	25.3		
nu star	278.5		
Approximate Chi Square Value (.05)	240.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	65.95
Adjusted Chi Square Value	238.6	95% Jackknife UCL	66.23
		95% Standard Bootstrap UCL	65.76
Anderson-Darling Test Statistic	1.371	95% Bootstrap-t UCL	66.7
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	65.75
Kolmogorov-Smirnov Test Statistic	0.25	95% Percentile Bootstrap UCL	66.03
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	65.66
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	78.13
		97.5% Chebyshev(Mean, Sd) UCL	86.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	103.2
95% Approximate Gamma UCL	67.71		
95% Adjusted Gamma UCL	68.37		
Potential UCL to Use		Use 95% Student's-t UCL	66.23
		or 95% Modified-t UCL	66.24

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Mercury

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	6
Raw Statistics		Log-transformed Statistics	
Minimum	0.0148	Minimum of Log Data	-4.213
Maximum	10	Maximum of Log Data	2.303
Mean	8.377	Mean of log Data	1.453
Median	10	SD of log Data	2.037
SD	3.644		
Coefficient of Variation	0.435		
Skewness	-1.973		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.472	Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	9.598	95% H-UCL	178.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.99
95% Adjusted-CLT UCL (Chen-1995)	9.257	97.5% Chebyshev (MVUE) UCL	118.4
95% Modified-t UCL (Johnson-1978)	9.552	99% Chebyshev (MVUE) UCL	172.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.798	Data do not follow a Discernable Distribution (0.05)	
Theta Star	10.5		
MLE of Mean	8.377		
MLE of Standard Deviation	9.378		
nu star	41.5		
Approximate Chi Square Value (.05)	27.73	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	9.553
Adjusted Chi Square Value	26.99	95% Jackknife UCL	9.598
		95% Standard Bootstrap UCL	9.481
Anderson-Darling Test Statistic	7.784	95% Bootstrap-t UCL	9.317
Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	9.31
Kolmogorov-Smirnov Test Statistic	0.509	95% Percentile Bootstrap UCL	9.521
Kolmogorov-Smirnov 5% Critical Value	0.177	95% BCA Bootstrap UCL	9.239
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.49
		97.5% Chebyshev(Mean, Sd) UCL	12.84
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.49
95% Approximate Gamma UCL	12.54		
95% Adjusted Gamma UCL	12.88		
Potential UCL to Use		Use 97.5% Chebyshev (Mean, Sd) UCL	12.84
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Nickel

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	11
Raw Statistics		Log-transformed Statistics	
Minimum	5.5	Minimum of Log Data	1.705
Maximum	78.08	Maximum of Log Data	4.358
Mean	60.05	Mean of log Data	3.987
Median	65	SD of log Data	0.607
SD	17.97		
Coefficient of Variation	0.299		
Skewness	-2.373		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.556	Shapiro Wilk Test Statistic	0.465
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	66.07	95% H-UCL	83.2
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	99.58
95% Adjusted-CLT UCL (Chen-1995)	64.09	97.5% Chebyshev (MVUE) UCL	114.9
95% Modified-t UCL (Johnson-1978)	65.79	99% Chebyshev (MVUE) UCL	144.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.258	Data do not follow a Discernable Distribution (0.05)	
Theta Star	14.1		
MLE of Mean	60.05		
MLE of Standard Deviation	29.1		
nu star	221.4		
Approximate Chi Square Value (.05)	188	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	65.84
Adjusted Chi Square Value	186	95% Jackknife UCL	66.07
		95% Standard Bootstrap UCL	65.61
Anderson-Darling Test Statistic	6.375	95% Bootstrap-t UCL	65.04
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	64.6
Kolmogorov-Smirnov Test Statistic	0.469	95% Percentile Bootstrap UCL	65.3
Kolmogorov-Smirnov 5% Critical Value	0.172	95% BCA Bootstrap UCL	64.82
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	75.41
		97.5% Chebyshev(Mean, Sd) UCL	82.06
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	95.12
95% Approximate Gamma UCL	70.73		
95% Adjusted Gamma UCL	71.5		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	75.41

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Silver

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.025	Minimum of Log Data	-3.689
Maximum	10.53	Maximum of Log Data	2.354
Mean	8.639	Mean of log Data	1.6
Median	10	SD of log Data	1.886
SD	3.384		
Coefficient of Variation	0.392		
Skewness	-2.185		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.46	Shapiro Wilk Test Statistic	0.411
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	9.773	95% H-UCL	124.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	77.03
95% Adjusted-CLT UCL (Chen-1995)	9.427	97.5% Chebyshev (MVUE) UCL	99.57
95% Modified-t UCL (Johnson-1978)	9.726	99% Chebyshev (MVUE) UCL	143.8
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.94	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.187		
MLE of Mean	8.639		
MLE of Standard Deviation	8.909		
nu star	48.9		
Approximate Chi Square Value (.05)	33.85	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	9.731
Adjusted Chi Square Value	33.02	95% Jackknife UCL	9.773
		95% Standard Bootstrap UCL	9.672
Anderson-Darling Test Statistic	8.109	95% Bootstrap-t UCL	9.505
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL	9.477
Kolmogorov-Smirnov Test Statistic	0.531	95% Percentile Bootstrap UCL	9.637
Kolmogorov-Smirnov 5% Critical Value	0.176	95% BCA Bootstrap UCL	9.616
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11.53
		97.5% Chebyshev(Mean, Sd) UCL	12.78
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15.24
95% Approximate Gamma UCL	12.48		
95% Adjusted Gamma UCL	12.79		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	11.53
Recommended UCL exceeds the maximum observation			

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	6
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.0052	Minimum of Log Data	-5.259
Maximum	0.285	Maximum of Log Data	-1.255
Mean	0.0644	Mean of log Data	-2.997
Median	0.0644	SD of log Data	0.839
SD	0.0494		
Coefficient of Variation	0.766		
Skewness	3.624		

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.448	Shapiro Wilk Test Statistic	0.594
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.081	95% H-UCL	0.105
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.125
95% Adjusted-CLT UCL (Chen-1995)	0.0877	97.5% Chebyshev (MVUE) UCL	0.149
95% Modified-t UCL (Johnson-1978)	0.0821	99% Chebyshev (MVUE) UCL	0.196
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.897	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.034		
MLE of Mean	0.0644		
MLE of Standard Deviation	0.0468		
nu star	98.65		
Approximate Chi Square Value (.05)	76.74	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.0803
Adjusted Chi Square Value	75.46	95% Jackknife UCL	0.081
		95% Standard Bootstrap UCL	0.08
Anderson-Darling Test Statistic	5.472	95% Bootstrap-t UCL	0.0909
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	0.153
Kolmogorov-Smirnov Test Statistic	0.438	95% Percentile Bootstrap UCL	0.0814
Kolmogorov-Smirnov 5% Critical Value	0.173	95% BCA Bootstrap UCL	0.0902
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.107
		97.5% Chebyshev(Mean, Sd) UCL	0.125
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.161
95% Approximate Gamma UCL	0.0828		
95% Adjusted Gamma UCL	0.0842		

Potential UCL to Use			
		Use 95% Chebyshev (Mean, Sd) UCL	0.107

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Vanadium

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	4
Raw Statistics		**Log-transformed Statistics**	
Minimum	27	Minimum of Log Data	3.296
Maximum	37.5	Maximum of Log Data	3.624
Mean	31.5	Mean of log Data	3.448
Median	31.5	SD of log Data	0.0587
SD	1.849		
Coefficient of Variation	0.0587		
Skewness	0.416		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.558	Shapiro Wilk Test Statistic	0.559
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	32.12	95% H-UCL	N/A
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	33.08
95% Adjusted-CLT UCL (Chen-1995)	32.13	97.5% Chebyshev (MVUE) UCL	33.77
95% Modified-t UCL (Johnson-1978)	32.12	99% Chebyshev (MVUE) UCL	35.11
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	267.8	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.118		
MLE of Mean	31.5		
MLE of Standard Deviation	1.925		
nu star	13924		
Approximate Chi Square Value (.05)	13650	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0398	95% CLT UCL	32.1
Adjusted Chi Square Value	13633	95% Jackknife UCL	32.12
		95% Standard Bootstrap UCL	32.08
Anderson-Darling Test Statistic	6.062	95% Bootstrap-t UCL	32.15
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	32.4
Kolmogorov-Smirnov Test Statistic	0.431	95% Percentile Bootstrap UCL	32.08
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	32.08
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	33.08
		97.5% Chebyshev(Mean, Sd) UCL	33.76
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	35.11
95% Approximate Gamma UCL	32.13		
95% Adjusted Gamma UCL	32.17		
Potential UCL to Use		Use 95% Student's-t UCL	32.12
		or 95% Modified-t UCL	32.12

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

General UCL Statistics for Full Data Sets

User Selected Options	
From File	163-01.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chromium

General Statistics

Number of Valid Observations	26	Number of Distinct Observations	4

Raw Statistics		Log-transformed Statistics	
Minimum	7.26	Minimum of Log Data	1.982
Maximum	85	Maximum of Log Data	4.443
Mean	47.23	Mean of log Data	3.807
Median	47.23	SD of log Data	0.39
SD	11.01		
Coefficient of Variation	0.233		
Skewness	-0.325		

Warning: There are only 4 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.403	Shapiro Wilk Test Statistic	0.318
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	50.92	95% H-UCL	56.24
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64.99
95% Adjusted-CLT UCL (Chen-1995)	50.64	97.5% Chebyshev (MVUE) UCL	72.15
95% Modified-t UCL (Johnson-1978)	50.9	99% Chebyshev (MVUE) UCL	86.22

Gamma Distribution Test		Data Distribution	
k star (bias corrected)	9.449	Data do not follow a Discernable Distribution (0.05)	
Theta Star	4.999		
MLE of Mean	47.23		
MLE of Standard Deviation	15.37		
nu star	491.3		
Approximate Chi Square Value (.05)	440.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	50.78
Adjusted Chi Square Value	437.8	95% Jackknife UCL	50.92
		95% Standard Bootstrap UCL	50.77
Anderson-Darling Test Statistic	7.941	95% Bootstrap-t UCL	50.35
Anderson-Darling 5% Critical Value	0.744	95% Hall's Bootstrap UCL	51.48
Kolmogorov-Smirnov Test Statistic	0.502	95% Percentile Bootstrap UCL	50.31
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	50.22
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	56.64
		97.5% Chebyshev(Mean, Sd) UCL	60.71
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	68.71
95% Approximate Gamma UCL	52.63		
95% Adjusted Gamma UCL	53.01		

Potential UCL to Use		Use 95% Student's-t UCL	50.92
		or 95% Modified-t UCL	50.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Total PAH

General Statistics			
Number of Valid Observations	26	Number of Distinct Observations	3

Raw Statistics		Log-transformed Statistics	
Minimum	0.016	Minimum of Log Data	-4.135
Maximum	0.285	Maximum of Log Data	-1.255
Mean	0.151	Mean of log Data	-1.955
Median	0.151	SD of log Data	0.462
SD	0.0381		
Coefficient of Variation	0.253		
Skewness	-5.8E-15		

Warning: There are only 3 Distinct Values in this data
There are insufficient Distinct Values to perform some GOF tests and bootstrap methods.
Those methods will return a 'N/A' value on your output display!

It is necessary to have 4 or more Distinct Values to compute bootstrap methods.
However, results obtained using 4 to 9 distinct values may not be reliable.
It is recommended to have 10-15 or more observations for accurate and meaningful bootstrap results.

Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.388	Shapiro Wilk Test Statistic	0.302
Shapiro Wilk Critical Value	0.92	Shapiro Wilk Critical Value	0.92
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.163	95% H-UCL	0.188
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.221
95% Adjusted-CLT UCL (Chen-1995)	0.163	97.5% Chebyshev (MVUE) UCL	0.249
95% Modified-t UCL (Johnson-1978)	0.163	99% Chebyshev (MVUE) UCL	0.303
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.344	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.0205		
MLE of Mean	0.151		
MLE of Standard Deviation	0.0555		
nu star	381.9		
Approximate Chi Square Value (.05)	337.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0398	95% CLT UCL	0.163
Adjusted Chi Square Value	334.8	95% Jackknife UCL	0.163
		95% Standard Bootstrap UCL	N/A
Anderson-Darling Test Statistic	8.17	95% Bootstrap-t UCL	N/A
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	N/A
Kolmogorov-Smirnov Test Statistic	0.508	95% Percentile Bootstrap UCL	N/A
Kolmogorov-Smirnov 5% Critical Value	0.171	95% BCA Bootstrap UCL	N/A
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.183
		97.5% Chebyshev(Mean, Sd) UCL	0.197
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.225
95% Approximate Gamma UCL	0.17		
95% Adjusted Gamma UCL	0.172		
Potential UCL to Use		Use 95% Student's-t UCL	0.163
		or 95% Modified-t UCL	0.163

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

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ATTACHMENT D4

TOXICITY VALUES

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Table D4.1. Toxicity Values and Information Used in Soils OU Risk Analysis

Chemical Abstract Number	Analyte	GI Absorption Factor (Unitless)	Oral RfD (RfDo)	Absorbed Dose (RfDd)	Inhalation (RfCi)	Inhalation (RfDi)	Oral Slope Factor (SFo)	Oral Slope Factor for Water (SFow)	Oral Slope Factor for Soil (SFos)	Absorbed Dose Slope Factor (SFd)	Inhalation Slope Factor (SFi)	External Exposure Slope Factor (SFe)	Volatile Organic?	PEF Res.	PEF Ind./ Comm.	VF Res.	VF Ind./ Comm.	KY Default ABS (Unitless)	Perme-ability Constant
7429905	Aluminum	1.00E+00	1.00E+00	1.00E+00	5.00E-03	1.43E-03								9.30E+08	6.20E+08			0.05	1.00E-03
7440360	Antimony (metallic)	1.50E-01	4.00E-04	6.00E-05										9.30E+08	6.20E+08			0.05	1.00E-03
7440382	Arsenic, Inorganic	1.00E+00	3.00E-04	3.00E-04	1.50E-05	4.29E-06	1.50E+00			1.50E+00	1.51E+01			9.30E+08	6.20E+08			0.03	1.00E-03
7440393	Barium	7.00E-02	2.00E-01	1.40E-02	5.00E-04	1.43E-04								9.30E+08	6.20E+08			0.05	1.00E-03
7440417	Beryllium and compounds	7.00E-03	2.00E-03	1.40E-05	2.00E-05	5.71E-06					8.40E+00			9.30E+08	6.20E+08			0.007	1.00E-03
7440428	Boron And Borates Only	1.00E+00	2.00E-01	2.00E-01	2.00E-02	5.71E-03								9.30E+08	6.20E+08			0.05	1.00E-03
7440439	Cadmium (Diet)	2.50E-02	1.00E-03	2.50E-05	1.00E-05	2.86E-06	3.80E-01				6.30E+00			9.30E+08	6.20E+08			0.001	1.00E-03
7440439	Cadmium (Water)	5.00E-02	5.00E-04	2.50E-05	1.00E-05	2.86E-06	3.80E-01				6.30E+00			9.30E+08	6.20E+08			0.001	1.00E-03
7440473	Chromium (Total)	0.013	1.50E+00	1.95E-02							2.94E+02			9.30E+08	6.20E+08			0.05	1.00E-03
7440484	Cobalt	1.00E+00	3.00E-04	3.00E-04	6.00E-06	1.71E-06					3.15E+01			9.30E+08	6.20E+08			0.05	4.00E-04
7440508	Copper	1.00E+00	4.00E-02	4.00E-02										9.30E+08	6.20E+08			0.05	1.00E-03
7439896	Iron	1.00E+00	7.00E-01	7.00E-01										9.30E+08	6.20E+08			0.05	1.00E-03
7439965	Manganese (Diet)	1.00E+00	1.40E-01	1.40E-01	5.00E-05	1.43E-05								9.30E+08	6.20E+08			0.04	1.00E-03
7439965	Manganese (Water)	4.00E-02	2.40E-02	9.60E-04	5.00E-05	1.43E-05								9.30E+08	6.20E+08			0.04	1.00E-03
7439976	Mercury, Inorganic Salts	7.00E-02	3.00E-04	2.10E-05										9.30E+08	6.20E+08	3.10E+04	2.08E+04	0.05	1.00E-03
7439987	Molybdenum	1.00E+00	5.00E-03	5.00E-03										9.30E+08	6.20E+08			0.05	1.00E-03
7440020	Nickel Soluble Salts	4.00E-02	2.00E-02	8.00E-04	9.00E-05	2.57E-05					9.10E-01			9.30E+08	6.20E+08			0.04	2.00E-04
7782492	Selenium	1.00E+00	5.00E-03	5.00E-03	2.00E-02	5.71E-03								9.30E+08	6.20E+08			0.05	1.00E-03
7440224	Silver	4.00E-02	5.00E-03	2.00E-04										9.30E+08	6.20E+08			0.04	6.00E-04
7791120	Thallium Chloride	1.00E+00	8.00E-05	8.00E-05										9.30E+08	6.20E+08			0.05	1.00E-03
238	Uranium (Soluble Salts)	1.00E+00	3.00E-03	3.00E-03	3.00E-04	8.57E-05								9.30E+08	6.20E+08			0.05	1.00E-03
	Vanadium and Compounds	1.00E+00	5.00E-03	5.00E-03										9.30E+08	6.20E+08			0.026	1.00E-03
7440666	Zinc (Metallic)	1.00E+00	3.00E-01	3.00E-01										9.30E+08	6.20E+08			0.05	6.00E-04
83329	Acenaphthene	1.00E+00	6.00E-02	6.00E-02	2.09E-01	5.97E-02							YES	9.30E+08	6.20E+08	8.38E+04	5.62E+04	0.13	8.60E-02
208968	Acenaphthylene	1.00E+00											YES	9.30E+08	6.20E+08	1.13E+05	7.57E+04	0.25	9.11E-02
107131	Acrylonitrile	1.00E+00	4.00E-02	4.00E-02	2.00E-03	5.71E-04	5.40E-01			5.40E-01	2.38E-01		YES	9.30E+08	6.20E+08	6.95E+03	4.66E+03	0.25	1.16E-03
120127	Anthracene	1.00E+00	3.00E-01	3.00E-01	1.05E+00	3.00E-01							YES	9.30E+08	6.20E+08	3.11E+05	2.09E+05	0.13	1.42E-01
71432	Benzene	1.00E+00	4.00E-03	4.00E-03	3.00E-02	8.57E-03	5.50E-02			5.50E-02	2.73E-02		YES	9.30E+08	6.20E+08	2.37E+03	1.59E+03	0.25	1.49E-02
86748	Carbazole	1.00E+00					2.00E-02			2.00E-02				9.30E+08	6.20E+08	2.00E+06	1.34E+06	0.1	5.36E-02
56235	Carbon Tetrachloride	1.00E+00	4.00E-03	4.00E-03	1.00E-01	2.86E-02	7.00E-02			7.00E-02	2.10E-02		YES	9.30E+08	6.20E+08	1.28E+03	8.57E+02	0.25	1.63E-02
67663	Chloroform	1.00E+00	1.00E-02	1.00E-02	9.77E-02	2.79E-02	3.10E-02			3.10E-02	8.05E-02		YES	9.30E+08	6.20E+08	2.09E+03	1.40E+03	0.25	6.83E-03
75354	Dichloroethylene, 1,1-	1.00E+00	5.00E-02	5.00E-02	2.00E-01	5.71E-02	6.00E-01			6.00E-01	1.75E-01		YES	9.30E+08	6.20E+08	1.02E+03	6.84E+02	0.25	1.17E-02
540590	Dichloroethylene, 1,2- (Mixed Isomers)	1.00E+00	9.00E-03	9.00E-03	3.14E-02	8.97E-03							YES	9.30E+08	6.20E+08	1.92E+03	1.29E+03	0.25	1.10E-02
156592	Dichloroethylene, 1,2-cis-	1.00E+00	2.00E-03	2.00E-03	3.49E-02	9.97E-03							YES	9.30E+08	6.20E+08	1.94E+03	1.30E+03	0.25	1.10E-02
156605	Dichloroethylene, 1,2-trans-	1.00E+00	2.00E-02	2.00E-02	6.00E-02	1.71E-02							YES	9.30E+08	6.20E+08	1.95E+03	1.31E+03	0.25	1.10E-02
60571	Dieldrin	1.00E+00	5.00E-05	5.00E-05			1.60E+01			1.60E+01	1.61E+01			9.30E+08	6.20E+08	1.36E+06	9.16E+05	0.1	3.26E-02
1746016	Dioxins/Furans (Total)	1.00E+00	1.00E-09	1.00E-09	4.00E-08	1.14E-08	1.30E+05			1.30E+05	1.33E+05			9.30E+08	6.20E+08	1.61E+06	1.08E+06	0.03	8.08E-01
100414	Ethylbenzene	1.00E+00	1.00E-01	1.00E-01	1.00E+00	2.86E-01	1.10E-02			1.10E-02	8.75E-03		YES	9.30E+08	6.20E+08	3.55E+03	2.38E+03	0.25	4.93E-02
206440	Fluoranthene	1.00E+00	4.00E-02	4.00E-02	1.40E-01	4.00E-02								9.30E+08	6.20E+08	1.58E+06	1.06E+06	0.13	3.08E-01
86737	Fluorene	1.00E+00	4.00E-02	4.00E-02	1.40E-01	4.00E-02							YES	9.30E+08	6.20E+08	1.67E+05	1.12E+05	0.13	1.10E-01
118741	Hexachlorobenzene	1.00E+00	8.00E-04	8.00E-04			1.60E+00			1.60E+00	1.61E+00			9.30E+08	6.20E+08	2.96E+04	1.99E+04	0.1	2.54E-01
37871004	HpCDD, 2,3,7,8-	1.00E+00	1.00E-07	1.00E-07	4.00E-06	1.14E-06	1.30E+03			1.30E+03	1.33E+03			9.30E+08	6.20E+08			0.03	1.81E+00
38998753	HpCDF, 2,3,7,8-	1.00E+00	1.00E-07	1.00E-07	4.00E-06	1.14E-06	1.30E+03			1.30E+03	1.33E+03			9.30E+08	6.20E+08			0.1	1.45E+00
34465468	HxCDD, 2,3,7,8-	1.00E+00	1.00E-08	1.00E-08	4.00E-07	1.14E-07	1.30E+04			1.30E+04	1.33E+04			9.30E+08	6.20E+08			0.03	2.86E+00
55684941	HxCDF, 2,3,7,8-	1.00E+00	1.00E-08	1.00E-08	4.00E-07	1.14E-07	1.30E+04			1.30E+04	1.33E+04			9.30E+08	6.20E+08			0.1	1.35E+00
91203	Naphthalene	1.00E+00	2.00E-02	2.00E-02	3.00E-03	8.57E-04					1.19E-01		YES	9.30E+08	6.20E+08	2.77E+04	1.86E+04	0.25	4.66E-02
88744	Nitroaniline, 2-	1.00E+00	1.00E-02	1.00E-02	5.00E-05	1.43E-05								9.30E+08	6.20E+08	2.68E+05	1.80E+05	0.1	4.46E-03
621647	Nitroso-di-N-propylamine, N-	1.00E+00					7.00E+00			7.00E+00	7.00E+00			9.30E+08	6.20E+08	1.13E+05	7.60E+04	0.1	2.33E-03
3268879	OCDD	1.00E+00	3.33E-06	3.33E-06	1.33E-04	3.80E-05	3.90E+01			3.90E+01	3.99E+01			9.30E+08	6.20E+08			0.03	1.16E+00
39001020	OCDF	1.00E+00	3.33E-06	3.33E-06	1.33E-04	3.80E-05	3.90E+01			3.90E+01	3.99E+01			9.30E+08	6.20E+08			0.1	2.63E+00
36088229	PeCDD, 2,3,7,8-	1.00E+00	1.00E-09	1.00E-09	4.00E-08	1.14E-08	1.30E+05			1.30E+05	1.33E+05			9.30E+08	6.20E+08			0.03	2.41E-01
57117416	PeCDF, 1,2,3,7,8-	1.00E+00	3.33E-08	3.33E-08	1.33E-06	3.80E-07	3.90E+03			3.90E+03	3.99E+03			9.30E+08	6.20E+08			0.1	6.27E-01
57117314	PeCDF, 2,3,4,7,8-	1.00E+00	3.33E-09	3.33E-09	1.33E-07	3.80E-08	3.90E+04			3.90E+04	3.99E+04			9.30E+08	6.20E+08			0.1	6.27E-01

Table D4.1. Toxicity Values and Information Used in Soils OU Risk Analysis (Continued)

Chemical Abstract Number	Analyte	GI Absorption Factor (Unitless)	Oral RfD (RfDo)	Absorbed Dose (RfDd)	Inhalation (RfCi)	Inhalation (RfDi)	Oral Slope Factor (SFo)	Oral Slope Factor for Water (SFow)	Oral Slope Factor for Soil (SFos)	Absorbed Dose Slope Factor (SFd)	Inhalation Slope Factor (SFi)	External Exposure Slope Factor (SFe)	Volatile Organic?	PEF Res.	PEF Ind./ Comm.	VF Res.	VF Ind./ Comm.	KY Default ABS (Unitless)	Perme-ability Constant
85018	Phenanthrene	1.00E+00											YES	9.30E+08	6.20E+08	3.82E+05	2.56E+05	0.25	1.44E-01
1336363	Polychlorinated Biphenyls (high risk)	1.00E+00					2.00E+00			2.00E+00	2.00E+00			9.30E+08	6.20E+08	5.48E+05	3.68E+05	0.14	5.45E-01
1336363	Polychlorinated Biphenyls (low risk)	1.00E+00					4.00E-01			4.00E-01	3.50E-01			9.30E+08	6.20E+08	5.48E+05	3.68E+05	0.14	5.45E-01
1336363	Polychlorinated Biphenyls (lowest risk)	1.00E+00					7.00E-02			7.00E-02	7.00E-02			9.30E+08	6.20E+08	5.48E+05	3.68E+05	0.14	5.45E-01
50328	Polynuclear Aromatic Hydrocarbons (Total)	1.00E+00					7.30E+00			7.30E+00	3.10E+00			9.30E+08	6.20E+08	1.27E+07	8.50E+06	0.13	
129000	Pyrene	1.00E+00	3.00E-02	3.00E-02	1.05E-01	3.00E-02							YES	9.30E+08	6.20E+08	1.41E+06	9.45E+05	0.13	2.01E-01
1746016	TCDD, 2,3,7,8-	1.00E+00	1.00E-09	1.00E-09	4.00E-08	1.14E-08	1.30E+05			1.30E+05	1.33E+05			9.30E+08	6.20E+08	1.61E+06	1.08E+06	0.03	8.08E-01
51207319	TCDF, 2,3,7,8-	1.00E+00	1.00E-08	1.00E-08	4.00E-07	1.14E-07	1.30E+04			1.30E+04	1.33E+04			9.30E+08	6.20E+08			0.1	6.57E-01
127184	Tetrachloroethylene	1.00E+00	1.00E-02	1.00E-02	2.71E-01	7.74E-02	5.40E-01			5.40E-01	2.07E-02		YES	9.30E+08	6.20E+08	1.75E+03	1.17E+03	0.25	3.34E-02
79016	Trichloroethylene	1.00E+00	3.00E-04	3.00E-04	4.00E-02	1.14E-02	3.22E-01			3.22E-01	3.22E-01		YES	9.30E+08	6.20E+08	1.68E+03	1.13E+03	0.25	1.16E-02
75014	Vinyl Chloride	1.00E+00	3.00E-03	3.00E-03	1.00E-01	2.86E-02	7.20E-01			7.20E-01	1.54E-02		YES	9.30E+08	6.20E+08	8.77E+02	5.89E+02	0.25	8.38E-03
1330207	Xylene, Mixture	1.00E+00	2.00E-01	2.00E-01	1.00E-01	2.86E-02							YES	9.30E+08	6.20E+08	3.65E+03	2.45E+03	0.25	4.71E-02
106423	Xylene, P-	1.00E+00	2.00E-01	2.00E-01	7.00E-01	2.00E-01							YES	9.30E+08	6.20E+08	3.52E+03	2.36E+03	0.25	4.93E-02
108383	Xylene, m-	1.00E+00	2.00E-01	2.00E-01	7.00E-01	2.00E-01							YES	9.30E+08	6.20E+08	3.44E+03	2.31E+03	0.25	5.32E-02
95476	Xylene, o-	1.00E+00	2.00E-01	2.00E-01	7.00E-01	2.00E-01							YES	9.30E+08	6.20E+08	4.04E+03	2.71E+03	0.25	4.71E-02
14596102	Am-241	5.00E-04						1.04E-10	2.17E-10		2.81E-08	2.76E-08		9.30E+08	6.20E+08				
10198400	Co-60	1.00E-01						1.57E-11	4.03E-11		3.58E-11	1.24E-05		9.30E+08	6.20E+08				
10045973	Cs-137+D	1.00E+00						3.04E-11	4.33E-11		1.19E-11	2.54E-06		9.30E+08	6.20E+08				
13994202	Np-237+D	5.00E-04						6.74E-11	1.62E-10		1.77E-08	7.95E-07		9.30E+08	6.20E+08				
13981163	Pu-238	5.00E-04						1.31E-10	2.72E-10		3.36E-08	7.22E-11		9.30E+08	6.20E+08				
15117483	Pu-239	5.00E-04						1.35E-10	2.76E-10		3.33E-08	2.00E-10		9.30E+08	6.20E+08				
14119336	Pu-240	5.00E-04						1.35E-10	2.77E-10		3.33E-08	6.98E-11		9.30E+08	6.20E+08				
14133767	Tc-99	5.00E-01						2.75E-12	7.66E-12		1.41E-11	8.14E-11		9.30E+08	6.20E+08				
14269637	Th-230	5.00E-04						9.10E-11	2.02E-10		2.85E-08	8.19E-10		9.30E+08	6.20E+08				
13966295	U-234	2.00E-02						7.07E-11	1.58E-10		1.14E-08	2.52E-10		9.30E+08	6.20E+08				
15117961	U-235+D	2.00E-02						7.18E-11	1.63E-10		1.01E-08	5.43E-07		9.30E+08	6.20E+08				
7440611	U-238+D	2.00E-02						8.71E-11	2.10E-10		9.35E-09	1.14E-07		9.30E+08	6.20E+08				

ATTACHMENT D5

TOXICITY PROFILES

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D5. TOXICITY PROFILES

D5.1 INORGANIC COMPOUNDS

D5.1.1 Aluminum (CAS 007429-90-5) (RAIS)

Aluminum is a silver-white, flexible metal with a vast number of uses. It makes up about 8% of the earth's crust. The aluminum content of seawater ranges from 3 to 2,400 µg/L. Aluminum metal is used as a structural material in the construction, automotive, and aircraft industries; in the production of metal alloys; and in the electrical industry in power lines, insulated cables, and wiring. Other uses of aluminum metal include cooking utensils, decorations, fencing, highway signs, cans, food packaging, foil, and dental crowns and dentures. Aluminum powder is used in paints and fireworks, and natural aluminum minerals are used in water purification, sugar refining, and in the brewing and paper industries. Aluminum borate is used in the production of glass and ceramics, and aluminum chloride is used to make rubber, lubricants, wood preservatives, and cosmetics. Aluminum chlorohydrate is the active ingredient in antiperspirants and deodorants, while aluminum hydroxide is used as a pharmaceutical to lower plasma phosphorus levels of patients with kidney failure. Until recently, aluminum has existed in forms not available to humans and most other species; however, acid rain has increased the availability of aluminum to biological systems and has resulted in destructive effects to fish and plant species. It is unknown if humans are susceptible to this increased bioavailability. It is poorly absorbed and efficiently eliminated; however, when absorption does occur, aluminum is distributed mainly in bone, liver, testes, kidneys, and brain.

The respiratory system appears to be the primary target following inhalation exposure to aluminum. Alveolar proteinosis has been observed in guinea pigs, rats, and hamsters exposed to aluminum powders. Rats and guinea pigs exposed to aluminum chlorohydrate exhibited an increase in alveolar macrophages, increased relative lung weight, and multifocal granulomatous pneumonia. Male rats exposed to aluminum (as aluminum chloride) via gavage for 6 months exhibited decreased spermatozoa counts and sperm motility and testicular histological and histochemical changes. Male rats exposed to drinking water containing aluminum (as aluminum potassium sulfate) for a lifetime exhibited increases in unspecified malignant and nonmalignant tumors, and similarly exposed female mice exhibited an increased incidence of leukemia. Rats and guinea pigs exposed via inhalation to aluminum chlorohydrate developed lung granulomas, while granulomatous foci developed in similarly exposed male hamsters.

Aluminum has been placed in the EPA weight-of-evidence classification D, not classifiable as to human carcinogenicity. No slope factors, therefore, were used in this BHHRA.

Chronic RfDs for aluminum also are available in RAIS. The oral and inhalation RfDs of 1.00E+00 and 1.43E-03 mg/(kg × day), respectively, were used in the BHHRA. The GI absorption factor is 1.0 and the corresponding absorbed dose RfD is 1.00E-01 mg/(kg × day).

D5.1.2 Antimony (CAS 007440-36-0) (RAIS)

Antimony is a naturally occurring silvery-white metal that is found in the earth's crust. Antimony ores are mined and then mixed with other metals to form antimony alloys or combined with oxygen to form antimony oxide. Little antimony is currently mined in the United States. It is brought into this country from other countries for processing; however, there are companies in the United States that produce antimony as a by-product of smelting lead and other metals. Antimony is used in lead storage batteries, solder, sheet and pipe metal, bearings, castings, and pewter. Antimony oxide is added to textiles and

plastics to prevent them from catching fire. It also is used in paints, ceramics, and fireworks, and as enamels for plastics, metal, and glass.

Metallic antimony and a few trivalent antimony compounds are the most significant regarding exposure potential and toxicity. Antimony is a common urban air pollutant, occurring at an average concentration of 0.001 $\mu g/m^3$. Exposure to antimony may occur via inhalation and by ingestion of contaminated food.

Acute oral and inhalation exposure of humans and animals to high doses of antimony or antimony-containing compounds (antimonials) may cause gastrointestinal disorders (vomiting, diarrhea), respiratory difficulties, and death at extremely high doses. Subchronic and chronic oral exposure may affect hematologic parameters. Long-term oral exposure to high doses of antimony or antimonials has been shown to adversely affect longevity in animals. Long-term occupational exposure of humans has resulted in electrocardiac disorders, respiratory disorders, and possibly increased mortality. Antimony levels for these occupational exposure evaluations ranged from 2.2 to 11.98 mg Sb/m^3. Based on limited data, occupational exposure of women to metallic antimony and several antimonials has been reported to have caused alterations in the menstrual cycle and an increased incidence of spontaneous abortions.

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified antimony as to its human carcinogenicity.

Chronic RfDs for antimony also are available in RAIS. The oral RfD used in the BHHRA is 4.00E-04 (mg/kg-day). The GI absorption factor is 0.15 and the corresponding absorbed dose RfD is 6.00E-05 (mg/kg-day).

D5.1.3 Arsenic (CAS 007440-38-2) (RAIS)

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds. Inorganic arsenic compounds are used mainly to preserve wood. Organic arsenic compounds are used as pesticides, primarily on cotton plants. Arsenic cannot be destroyed in the environment. It can change its form, only. Arsenic in air either will settle to the ground or will be washed out of the air by rain. Many arsenic compounds can dissolve in water. Fish and shellfish can accumulate arsenic, but the arsenic in fish is mostly in a form that is not harmful. The toxicity of inorganic arsenic depends on its valence state and also on the physical and chemical properties of the compound in which it occurs.

Water soluble inorganic arsenic compounds are absorbed through the GI tract and lungs; distributed primarily to the liver, kidney, lung, spleen, aorta, and skin; and excreted mainly in the urine at rates as high as 80%. Symptoms of acute inorganic arsenic poisoning in humans are nausea, anorexia, vomiting, epigastric and abdominal pain, and diarrhea. Dermatitis (exfoliative erythroderma), muscle cramps, cardiac abnormalities, hepatotoxicity, bone marrow suppression and hematologic abnormalities (anemia), vascular lesions, and peripheral neuropathy (motor dysfunction, paresthesia) also have been reported. Oral doses as low as 20-60 $\mu g/kg/day$ have been reported to cause toxic effects in some individuals. Severe exposures can result in acute encephalopathy, congestive heart failure, stupor, convulsions, paralysis, coma, and death. The acute lethal dose to humans has been estimated to be about 0.6 mg/kg/day.

General symptoms of chronic arsenic poisoning in humans are weakness, general debility and lassitude, loss of appetite and energy, loss of hair, hoarseness of voice, loss of weight, and mental disorders. Primary target organs are the skin (hyperpigmentation and hyperkeratosis), nervous system (peripheral

neuropathy), and vascular system. Anemia, leukopenia, hepatomegaly, and portal hypertension also have been reported. In addition, possible reproductive effects include a high male to female birth ratio.

Epidemiological studies have revealed an association between arsenic concentrations in drinking water and increased incidences of skin cancers, as well as cancers of the liver, bladder, respiratory, and GI tracts. Occupational exposure studies have shown a clear correlation between exposure to arsenic and lung cancer mortality. Several studies have shown that inorganic arsenic can increase the risk of lung cancer, skin cancer, bladder cancer, liver cancer, kidney cancer, and prostate cancer. The World Health Organization, the DHHS, and the EPA have determined that inorganic arsenic is a human carcinogen and is classified A, human carcinogen.

Cancer slope factors for arsenic are available from EPA's IRIS. The values used in the BHHRA are 1.50E+00, 1.51E+01, and 1.50 E+00 $[mg/(kg \times day)]^{-1}$ for the oral, inhalation, and dermal exposure routes, respectively. The slope factor for the dermal exposure route was calculated by assuming a GI absorption factor of 1.0.

Chronic RfDs for arsenic also are available in RAIS. The oran and dermal values used in the BHHRA were 3.00E-04 mg/(kg × day) for both. The dermal RfD was calculated by assuming a GI absorption factor of 1.0.

D5.1.4 Barium (CAS 7440-39-3) (RAIS)

The soluble salts of barium, an alkaline earth metal, are toxic in mammalian systems. They are absorbed rapidly from the gastrointestinal tract and are deposited in the muscles, lungs, and bone. Barium is excreted primarily in the feces.

At low doses, barium acts as a muscle stimulant and at higher doses affects the nervous system eventually leading to paralysis. Acute and subchronic oral doses of barium cause vomiting and diarrhea, followed by decreased heart rate and elevated blood pressure. Higher doses result in cardiac irregularities, weakness, tremors, anxiety, and dyspnea. A drop in serum potassium may account for some of the symptoms. Death can occur from cardiac and respiratory failure. Acute doses around 0.8 grams can be fatal to humans.

Subchronic and chronic oral or inhalation exposure primarily affects the cardiovascular system resulting in elevated blood pressure. A lowest-observed-adverse-effect level (LOAEL) of 0.51 mg barium/kg/day based on increased blood pressure was observed in chronic oral rat studies (Perry et al. 1983), whereas human studies identified a no-observed-adverse-effect level (NOAEL) of 0.21 mg barium/kg/day (Wones et al. 1990, Brenniman and Levy 1984). The human data were used by the EPA to calculate a chronic and subchronic oral reference dose (RfD) of 0.07 mg/kg/day (EPA 1995a,b). In the Wones et al. study, human volunteers were given barium up to 10 mg/L in drinking water for 10 weeks. No clinically significant effects were observed. An epidemiological study was conducted by Brenniman and Levy in which human populations ingesting 2 to 10 mg/L of barium in drinking water were compared to a population ingesting 0 to 0.2 mg/L. No significant individual differences were seen; however, a significantly higher mortality rate from all combined cardiovascular diseases was observed with the higher barium level in the 65+ age group. The average barium concentration was 7.3 mg/L, which corresponds to a dose of 0.20 mg/kg/day. Confidence in the oral RfD is rated medium by the EPA.

Subchronic and chronic inhalation exposure of human populations to barium-containing dust can result in a benign pneumoconiosis called "baritosis." This condition is often accompanied by an elevated blood pressure but does not result in a change in pulmonary function. Exposure to an air concentration of 5.2 mg barium carbonate/m^3 for 4 hours/day for 6 months has been reported to result in elevated blood pressure and decreased body weight gain in rats (Tarasenko et al. 1977). Reproduction and developmental effects

were also observed. Increased fetal mortality was seen after untreated females were mated with males exposed to 5.2 mg/m^3 of barium carbonate. Similar results were obtained with female rats treated with 13.4 mg barium carbonate/m^3. The NOAEL for developmental effects was 1.15 mg/m^3 (equivalent to 0.8 mg barium/m^3). An inhalation reference concentration (RfC) of 0.005 mg/m^3 for subchronic and 0.0005 mg/m^3 for chronic exposure was calculated by the EPA based on the NOAEL for developmental effects (EPA 1995a). These effects have not been substantiated in humans or other animal systems.

Barium has not been evaluated by the EPA for evidence of human carcinogenic potential (EPA 1995b). Chronic RfDs for barium also are available in RAIS. The oral RfD used in the BHHRA is 2.00E-01 (mg/kg-day). The GI absorption factor is 7.00E-02 and the corresponding absorbed dose RfD is 1.40E-02 (mg/kg-day).

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D5.1.5 Beryllium (CAS 007440-41-7) (RAIS)

Beryllium is a metallic element. Pure beryllium is a hard, grayish metal. In nature, beryllium can be found in compounds in mineral rocks, coal, soil, and volcanic dust. Beryllium compounds have no particular smell. Beryllium occurs naturally in the earth's crust at concentrations ranging from 2-10 ppm. It is also released into the atmosphere from coal combustion at concentrations of ~0.01-0.1 ng/m^3, most likely as beryllium oxide. Beryllium occurs in house dust, surface water, food, and soil. The general population is exposed to beryllium every day. Cigarette smokers can be exposed to nearly twice the amount of beryllium as nonsmokers. Beryllium compounds are commercially mined, and the beryllium purified for use in electrical parts, machine parts, ceramics, aircraft parts, nuclear weapons, and mirrors. Currently, beryllium has many industrial uses (e.g., in brake systems of airplanes, for neutron monochromatization, as window material for x-ray tubes, and in radiation detectors). The commercially important compound,

beryllium oxide, is used in the electronics industry as a substrate for transistors and silicon chips, coil cores, and laser tubes.

Limited data indicate that the oral toxicity of beryllium is low in humans. No adverse effects were noted in mice given 5 ppm beryllium in the drinking water in a lifetime bioassay. In contrast, the toxicity of inhaled beryllium is well-documented. Humans inhaling "massive" doses of beryllium compounds may develop acute berylliosis. ATSDR estimated that, based on existing data, the disease could develop at levels ranging from approximately 2-1000 μg Be/m^3. This disease usually develops shortly after exposure and is characterized by rhinitis, pharyngitis, and/or tracheobronchitis, and may progress to severe pulmonary symptoms. The severity of acute beryllium toxicity correlates with exposure levels, and the disease is now rarely observed in the United States because of improved industrial hygiene. Humans inhaling beryllium also may develop chronic berylliosis which, in contrast to acute berylliosis, is highly variable in onset, is more likely to be fatal and can develop a few months to >=20 years after exposure.

Epidemiologic studies have suggested that beryllium and its compounds could be human carcinogens. Studies in workers exposed to beryllium, mostly via inhalation, have shown significant increases in observed over expected lung cancer incidences. The U.S. EPA, in evaluating the total database for the association of lung cancer with occupational exposure to beryllium, noted several limitations, but concluded that the results must be considered to be at least suggestive of a carcinogenic risk to humans. In laboratory studies, beryllium sulfate caused increased incidences of pulmonary tumors in rats and rhesus monkeys.

Based on sufficient evidence for animals and inadequate evidence for humans, beryllium has been placed in the EPA weight-of-evidence classification B2, probable human carcinogen.

A chronic RfD for the oral route of exposure from RAIS was used in the BHHRA. The values used in the BHHRA are 2.00E-03, 5.71E-06, and 1.40E-05 (mg/kg-day) for the oral, inhalation, and dermal routes, respectively. The dermal RfD was calculated assuming a GI absorption factor of 7.0. The cancer slope factor for beryllium from RAIS was used in the BHHRA. The value used was 4.30E+00, 8.40E+00, and $6.14E+02[mg/(kg \times day)]^{-1}$ for the oral, inhalation, and dermal routes of exposure. The value for the oral and dermal slope factor was withdrawn by NCEA and the Federal Facility Agreement parties have agreed not to include the withdrawn slope factor for beryllium in BHHRAs for PGDP.

D5.1.6 Chromium III (CAS 16065-83-1) and Chromium VI (CAS 18540-29-9) (RAIS)

Elemental chromium does not occur in nature, but it is present in ores, primarily chromite. Chromium can be found in rocks, animals, plants, soil, and in volcanic dust and gases. Chromium is present in the environment in several different forms (oxidation states). The most common forms are chromium (0), chromium (III), and chromium (VI). No taste or odor is associated with chromium compounds. Chromium (III) occurs naturally in the environment and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium (VI) and chromium (0) generally are produced by industrial processes. The metal chromium, chromium (0), is used for making steel. Chromium (VI) and chromium (III) are used for chrome plating, dyes and pigments, leather tanning, and wood preserving.

Chromium enters the body through the lungs, digestive tract and, to a lesser extent, the skin. Inhalation is the most important route for occupational exposure. Non-occupational exposure occurs via ingestion of chromium-containing food and water. Breathing high levels of chromium (VI) can cause irritation to the nose, such as runny nose, nosebleeds, and ulcers and holes in the nasal septum. Ingesting large amounts of chromium (VI) can cause stomach upsets and ulcers, convulsions, kidney and liver damage, and even death. Skin contact with certain chromium (VI) compounds can cause skin ulcers. Some people are

extremely sensitive to chromium (VI) or chromium (III). Allergic reactions consisting of severe redness and swelling of the skin have been noted.

Several studies have shown that chromium (VI) compounds can increase the risk of lung cancer when inhaled. Animal studies also have shown an increased risk of cancer. There also is evidence for an increased risk of developing nasal, pharyngeal, and GI carcinomas. Based on sufficient evidence for humans and animals, Chromium (VI) has been placed in the EPA weight-of-evidence classification A: human carcinogen. Chromium (III) is most appropriately designated a Group D – Not classified as to its human carcinogenicity; however, the classification of chromium (VI) as a known human carcinogen raises a concern for the carcinogenic potential of trivalent chromium.

The cancer slope factor for chromium (VI) from RAIS was used in the BHHRA. The value used was2.86E-05 $[mg/(kg \times day)]^{-1}$ for the inhalation route of exposure. Slope factors for the oral and dermal routes of exposure are not available.

Consistent with the Risk Methods Document, the chronic RfDs from RAIS associated with Chromium (III) were used in the BHHRA. The values used were 1.50E+00 and 1.95E-02 mg/(kg × day) for the oral and dermal routes, respectively. The dermal RfD was calculated by assuming a GI absorption factor of 1.30E-02.

D5.1.7 Cobalt

Cobalt is a naturally-occurring element that has properties similar to those of iron and nickel. It has an atomic number of 27. There is only one stable isotope of cobalt, which has an atomic mass number of 59. However, there are many unstable or radioactive isotopes, two of which are commercially important, Co-60 and Co-57. All isotopes of cobalt behave the same chemically and will therefore have the same chemical behavior in the environment and the same chemical effects on the human body.

Small amounts of cobalt occur in natural forms in most rocks, soil, water, plants, and animals, typically in small amounts. Cobalt is also found in meteorites. Elemental cobalt is a hard, silvery grey metal. However, cobalt is usually found in the environment combined with other elements such as oxygen, sulfur, and arsenic. Small amounts of these chemical compounds can be found in rocks, soil, plants, and animals. A biochemically important cobalt compound is vitamin B12 or cyanocobalamin. Vitamin B12 is essential for good health in animals and humans.

Cobalt metal usually is mixed with other metals to form alloys, which are harder or more resistant to wear and corrosion. These alloys are used in a number of military and industrial applications such as aircraft engines, magnets, and grinding and cutting tools. They are also used in artificial hip and knee joints. Cobalt compounds are used as colorants in glass, ceramics, and paints, as catalysts, and as paint driers. Cobalt colorants have a characteristic blue color; however, not all cobalt compounds are blue. Cobalt compounds are also used as trace element additives in agriculture and medicine.

Cobalt has both beneficial and harmful effects on human health. Cobalt is beneficial for humans because it is part of vitamin B12, which is essential to maintain human health. Cobalt (0.16–1.0 mg cobalt/kg of body weight) has also been used as a treatment for anemia, including in pregnant women, because it causes red blood cells to be produced. Cobalt also increases red blood cell production in healthy people, but only at very high exposure levels. Cobalt is also essential for the health of various animals, such as cattle and sheep. Exposure of humans and animals to levels of cobalt normally found in the environment is not harmful.

Too much cobalt can cause harmful health effects. Workers who breathed air containing 0.038 mg cobalt/m3 (about 100,000 times the concentration normally found in ambient air) for 6 hours had trouble breathing. Serious effects on the lungs, including asthma, pneumonia, and wheezing, have been found in people exposed to 0.005 mg cobalt/m3 while working with hard metal, a cobalt-tungsten carbide alloy. People exposed to 0.007 mg cobalt/m3 at work have also developed allergies to cobalt that resulted in asthma and skin rashes.

Nonradioactive cobalt has not been found to cause cancer in humans or in animals following exposure in the food or water. Cancer has been shown, however, in animals who breathed cobalt or when cobalt was placed directly into the muscle or under the skin. Based on the animal data, the International Agency for Research on Cancer (IARC) has determined that cobalt is possibly carcinogenic to humans.

Much of our knowledge of cobalt toxicity is based on animal studies. Cobalt is essential for the growth and development of certain animals, such as cows and sheep. Short-term exposure of rats to high levels of cobalt in the air results in death and lung damage. Longer-term exposure of rats, guinea pigs, hamsters, and pigs to lower levels of cobalt in the air results in lung damage and an increase in red blood cells. Short-term exposure of rats to high levels of cobalt in the food or drinking water results in effects on the blood, liver, kidneys, and heart. Longer-term exposure of rats, mice, and guinea pigs to lower levels of cobalt in the food or drinking water results in effects on the same tissues (heart, liver, kidneys, and blood) as well as the testes, and also causes effects on behavior. Sores were seen on the skin of guinea pigs following skin contact with cobalt for 18 days. Generally, cobalt compounds that dissolve easily in water are more harmful than those that are hard to dissolve in water.

Cancer slope factors for cobalt used in the BHHRA are 3.15E+01 $[mg/(kg \times day)]^{-1}$ for the inhalation exposure routes, respectively. Chronic RfDs for cobalt used in the BHHRA were 3.00E-04 mg/(kg × day) for both oral and absorbed doses. The dermal RfD was calculated by assuming a GI absorption factor of 1.0.

D5.1.8 Copper (CAS 007440-50-8) (RAIS)

Copper is a reddish metal that occurs naturally in the environment in plants and animals. Copper is an essential element for all living things including humans. Copper is extensively mined in the United States and is used to make wire, sheet metal, pipes, and pennies. It also is used in farming to treat some plant diseases; in water treatment; and to preserve wood, leather, and fabrics. Also, because of its high electrical and thermal conductivity and other properties such as malleability, metallic copper is widely used in the manufacture of electrical equipment.

Copper is an essential trace element that is widely distributed in animal and plant tissues. Copper is necessary for good health and can be absorbed by the oral, inhalation, and dermal routes of exposure. Very large doses, however, can be harmful. In humans, ingestion of gram quantities of copper salts may cause GI, hepatic, and renal effects with symptoms such as severe abdominal pain, vomiting, diarrhea, hemolysis, hepatic necrosis, hematuria, proteinuria, hypotension, tachycardia, convulsions, coma, and death. Acute inhalation exposure to copper dust or fumes at concentrations of 0.075-0.12 mg Cu/m3 may cause metal fume fever with symptoms such as cough, chills and muscle ache. Skin contact with copper can result in an allergic reaction, usually skin irritation or a skin rash.

No suitable bioassays or epidemiological studies are available to assess the carcinogenicity of copper. U.S. EPA, therefore, has placed copper in weight-of-evidence group D, not classifiable as to human carcinogenicity. No slope factors, therefore, were used in this BHHRA.

The chronic RfDs for the oral and dermal routes of exposure from RAIS was used in the BHHRA. The oral and dermal RfDs used were 4.00E-02 (mg/kg-day), for both. The GI absorption factor used was 1.0.

D5.1.9 Iron (CAS 007439-89-6)

Iron is one of the most abundant metals in the environment and is used in many industrial processes. It is an essential element in the human diet. More than 80% of the iron present in the body is involved in the support of red blood cell production. In addition, it is also an essential component of myoglobin and various enzymes. Iron deficiency is the most common cause of anemia (Goodman and Gilman 1985). Exposure to excessive levels of iron may cause GI damage and dysfunction and enlargement of the liver and pancreas (Goodman and Gilman 1985).

Iron has not been classified by EPA with regard to cancer weight-of-evidence. No slope factors were used in this BHHRA.

Chronic RfDs also have not been released by EPA in IRIS or HEAST; however, oral and dermal RfDs of 7.00E-01 mg/(kg × day), for both, were used in the BHHRA based on a provisional value from NCEA. The GI absorption factor used was 1.0.

D5.1.10 Lead (CAS No. 743-99-21) (RAIS)

Lead occurs naturally as a sulfide in galena. It is a soft, bluish-white, silvery gray, malleable metal with a melting point of 327.5C. Elemental lead reacts with hot boiling acids and is attacked by pure water. The solubility of lead salts in water varies from insoluble to soluble depending on the type of salt (IARC, 1980; Goyer, 1988; Budavari et al., 1989).

Lead is a natural element that is persistent in water and soil. Most of the lead in environmental media is of anthropogenic sources. The mean concentration is 3.9 µg/L in surface water and 0.005 µg/L in sea water. River sediments contain about 20,000 µg/g and coastal sediments about 100,000 µg/g. Soil content varies with the location, ranging up to 30 µg/g in rural areas, 3000 µg/g in urban areas, and 20,000 µg/g near point sources. Human exposure occurs primarily through diet, air, drinking water, and ingestion of dirt and paint chips (EPA, 1989a; ATSDR, 1993).

The efficiency of lead absorption depends on the route of exposure, age, and nutritional status. Adult humans absorb about 10-15% of ingested lead, whereas children may absorb up to 50%, depending on whether lead is in the diet, dirt, or paint chips. More than 90% of lead particles deposited in the respiratory tract are absorbed into systemic circulation. Inorganic lead is not efficiently absorbed through the skin; consequently, this route does not contribute considerably to the total body lead burden (EPA, 1986a).

Lead absorbed into the body is distributed to three major compartments: blood, soft tissue, and bone. The largest compartment is the bone, which contains about 95% of the total body lead burden in adults and about 73% in children. The half-life of bone lead is more than 20 years. The concentration of blood lead changes rapidly with exposure, and its half-life of only 25-28 days is considerably shorter than that of bone lead. Blood lead is in equilibrium with lead in bone and soft tissue. The soft tissues that take up lead are liver, kidneys, brain, and muscle. Lead is not metabolized in the body, but it may be conjugated with glutathione and excreted primarily in the urine (EPA, 1986a,c; ATSDR, 1993). Exposure to lead is evidenced by elevated blood lead levels.

The systemic toxic effects of lead in humans have been well-documented by the EPA (EPA, 1986a-e, 1989a, 1990) and ATSDR (1993), who reviewed and evaluated extensively data reported in the literature

up to 1991. The evidence shows that lead is a multitargeted toxicant, causing effects in the gastrointestinal tract, hematopoietic system, cardiovascular system, central and peripheral nervous systems, kidneys, immune system, and reproductive system. Overt symptoms of subencephalopathic central nervous system (CNS) effects and peripheral nerve damage occur at blood lead levels of 40-60 µg/dL, and nonovert symptoms, such as peripheral nerve dysfunction, occur at levels of 30-50 µg/dL in adults; no clear threshold is evident. Cognitive and neuropsychological deficits are not usually the focus of studies in adults, but there is some evidence of neuropsychological impairment (Ehle and McKee, 1990) and cognitive deficits in lead workers with blood levels of 41-80 ug/dL (Stollery et al., 1991).

Although similar effects occur in adults and children, children are more sensitive to lead exposure than are adults. Irreversible brain damage occurs at blood lead levels greater than or equal to 100 µg/dL in adults and at 80-100 µg/dL in children; death can occur at the same blood levels in children. Children who survive these high levels of exposure suffer permanent severe mental retardation.

As discussed previously, neuropsychological impairment and cognitive (IQ) deficits are sensitive indicators of lead exposure; both neuropsychological impairment and IQ deficits have been the subject of cross-sectional and longitudinal studies in children. One of the early studies reported IQ score deficits of four points at blood lead levels of 30-50 ug/dL and one to two points at levels of 15-30 ug/dL among 75 black children of low socioeconomic status (Schroeder and Hawk, 1986).

Very detailed longitudinal studies have been conducted on children (starting at the time of birth) living in Port Pirie, Australia (Vimpani et al., 1985, 1989; McMichael et al., 1988; Wigg et al., 1988; Baghurst et al., 1992a,b), Cincinnati, Ohio (Dietrich et al., 1986, 1991, 1992, 1993), and Boston, Massachusetts (Bellinger et al., 1984, 1987a,b, 1990, 1992; Stiles and Bellinger 1993). Various measures of cognitive performance have been assessed in these children. Studies of the Port Pirie children up to 7 years of age revealed IQ deficits in 2-year-old children of 1.6 points for each 10-µg/dL increase in blood lead, deficits of 7.2 points in 4-year-old children, and deficits of 4.4 to 5.3 points in 7-year-old children as blood lead increased from 10-30 µg/dL. No significant neurobehavioral deficits were noted for children, 5 years or younger, who lived in the Cincinnati, Ohio, area. In 6.5-year-old children, performance IQ was reduced by 7 points in children whose lifetime blood level exceeded 20 µg/dL.

Children living in the Boston, Massachusetts, area have been studied up to the age of 10 years. Cognitive performance scores were negatively correlated with blood lead in the younger children in the high lead group (greater than or equal to 10 µg/dL), and improvements were noted in some children at 57 months as their blood lead levels became lower. However, measures of IQ and academic performance in 10-year-old children showed a 5.8-point deficit in IQ and an 8.9-point deficit in academic performance as blood lead increased by 10 µg/dL within the range of 1-25 µg/dL. Because of the large database on subclinical neurotoxic effects of lead in children, only a few of the studies have been included. However, EPA (EPA, 1986a, 1990) concluded that there is no clear threshold for neurotoxic effects of lead in children.

In adults, the cardiovascular system is a very sensitive target for lead. Hypertension (elevated blood pressure) is linked to lead exposure in occupationally exposed subjects and in the general population. Three large population-based studies have been conducted to study the relationship between blood lead levels and high blood pressure. The British Regional Heart Study (BRHS) (Popcock et al., 1984), the NHANES II study (Harlan et al., 1985; Pirkle et al., 1985; Landis and Flegal, 1988; Schwartz, 1991; EPA, 1990), and Welsh Heart Programme (Ellwood et al., 1988a,b) comprise the major studies for the general population. The BRHS study showed that systolic pressure greater than 160 mm Hg and diastolic pressure greater than 100 mm Hg were associated with blood lead levels greater than 37 µg/dL (Popcock et al., 1984). An analysis of 9933 subjects in the NHANES study showed positive correlations between blood pressure and blood lead among 12-74-year-old males but not females (Harlan et al., 1985; Landis and Flegal et al., 1988), 40-59-year-old white males with blood levels ranging from 7-34 µg/dL (Pirkle et

al., 1985), and males and females greater than 20 years old (Schwartz, 1991). In addition, left ventricular hypertrophy was also positively associated with blood lead (Schwartz, 1991). The Welsh study did not show an association among men and women with blood lead of 12.4 and 9.6 µg/dL, respectively (Ellwood et al., 1988a,b). Other smaller studies showed both positive and negative results. The EPA (EPA, 1990) concluded that increased blood pressure is positively correlated with blood lead levels in middle-aged men, possibly at concentrations as low as 7 µg/dL. In addition, the EPA estimated that systolic pressure is increased by 1.5-3.0 mm Hg in males and 1.0-2.0 mm Hg in females for every doubling of blood lead concentration.

The hematopoietic system is a target for lead as evidenced by frank anemia occurring at blood lead levels of 80 µg/dL in adults and 70 µg/dL in children. The anemia is due primarily to reduced heme synthesis, which is observed in adults having blood levels of 50 µg/dL and in children having blood levels of 40 µg/dL. Reduced heme synthesis is caused by inhibition of key enzymes involved in the synthesis of heme. Inhibition of erythrocyte-aminolevulinic acid dehydrase (ALAD) activity (catalyzes formation of porphobilinogen from -aminolevulinic acid) has been detected in adults and children having blood levels of less than 10 µg/dL. ALAD activity is the most sensitive measure of lead exposure, but erythrocyte zinc protoporphyrin is the most reliable indicator of lead exposure because it is a measure of the toxicologically active fraction of bone lead. The activity of another erythrocyte enzyme, pyrimidine-5-nucleotidase, is also inhibited by lead exposure. Inhibition has been observed at levels below 5 µg/dL; no clear threshold is evident.

Other organs or systems affected by exposure to lead are the kidneys, immune system, reproductive system, gastrointestinal tract, and liver. These effects usually occur at high blood levels, or the blood levels at which they occur have not been sufficiently documented.

The EPA has not developed an RfD for lead because it appears that lead is a nonthreshold toxicant, and it is not appropriate to develop RfDs for these types of toxicants. Instead the EPA has developed the Integrated Exposure Uptake Biokenetic Model to estimate the percentage of the population of children up to 6 years of age with blood lead levels above a critical value, 10 µg/dL. The model determines the contribution of lead intake from multimedia sources (diet, soil and dirt, air, and drinking water) on the concentration of lead in the blood. Site-specific concentrations of lead in various media are used when available; otherwise default values are assumed. The EPA has established a screening level of 400 mg/kg for lead in residential soil and 800 mg/kg in industrial soil (EPA, 2010).

Inorganic lead and lead compounds have been evaluated for carcinogenicity by the EPA (EPA, 1989a, 1994a). The data from human studies are inadequate for evaluating the potential carcinogenicity of lead. Data from animal studies, however, are sufficient based on numerous studies showing that lead induces renal tumors in experimental animals. A few studies have shown evidence for induction of tumors at other sites (cerebral gliomas; testicular, adrenal, prostate, pituitary, and thyroid tumors). An oral slope factor of 8.50E-03 has been developed by the California EPA. No other slope factors are available.

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D5.1.11 Manganese (CAS 007439-96-5) (RAIS)

Manganese is a silver-colored, naturally occurring metal that is found in many types of rocks and makes up about 0.10% of the earth's crust. Manganese is not found alone, but combines with other substances such as oxygen, sulfur, or chlorine. Manganese also can be combined with carbon to make organic manganese compounds, including pesticides (e.g., maneb or mancozeb) and methylcyclopentadienyl manganese tricarbonyl, a fuel additive in some gasolines. Manganese is an essential trace element and is necessary for good health. Normal nutritional requirements of manganese are satisfied through the diet, which is the normal source of the element, with minor contributions from water and air. The National Research Council recommends a dietary allowance of 2-5 mg/day for a safe and adequate intake of manganese for an adult human. Manganese can be found in several food items, including grains, cereals, and tea.

Manganese can elicit a variety of serious toxic responses upon prolonged exposure to elevated concentrations, either orally or by inhalation. The central nervous system is the primary target. Initial symptoms are headache, insomnia, disorientation, anxiety, lethargy, and memory loss. These symptoms

progress with continued exposure and eventually include motor disturbances, tremors, and difficulty in walking, symptoms similar to those seen with Parkinsonism. These motor difficulties are often irreversible. Some individuals exposed to very high levels of manganese for long periods of time at work developed mental and emotional disturbances and slow and clumsy body movements. This combination of symptoms is a disease called “manganism.”

There are no human cancer data available for manganese. Manganese has been placed in the EPA weight-of-evidence classification D: not classifiable as to human carcinogenicity. No slope factors, therefore, were used in this BHHRA.

The oral, inhalation, and dermal RfDs for manganese in diet from RAIS used in the BHHRA were 1.40E-01 and 1.43E-05, and 1.40E-01 mg/(kg × day), respectively. The GI absorption factor is 1.0.

D5.1.12 Mercury (CAS 007439-97-6) (RAIS)

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid; if heated, it is a colorless, odorless gas. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or "salts," which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds; methylmercury is the most common organic mercury compound and is produced mainly by microscopic organisms in the water and soil. More mercury in the environment can increase the amounts of methylmercury that these small organisms make. Metallic mercury is used to produce chlorine gas and caustic soda and is also used in thermometers, dental fillings, electrical switches, and batteries. Mercury salts are sometimes used in skin lightening creams and as antiseptic creams and ointments.

The nervous system is very sensitive to all forms of mercury. Methylmercury and metallic mercury vapors are more harmful than other forms, because more mercury reaches the brain in these forms. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

No data were available regarding the carcinogenicity of mercury in humans or animals. EPA has placed inorganic mercury in weight-of-evidence classification D, not classifiable as to human carcinogenicity. Other forms of mercury are possible human carcinogens.

A chronic RfD for the oral route of exposure from RAIS was used in the BHHRA. The values used in the BHHRA are 3.00E-04 and 2.10E-05 (mg/kg-day) for the oral and dermal routes, respectively. The dermal RfD was calculated assuming a GI absorption factor of 7.0E-02.

D5.1.13 Molybdenum CAS No. 7439-98-7) (RAIS)

Molybdenum (Mo) occurs naturally in various ores; the principal source being molybdenite (MoS_2) (Stokinger, 1981). Molybdenum compounds are used primarily in the production of metal alloys. Molybdenum is considered an essential trace element; the provisional recommended dietary intake is 75-250 g/day for adults and older children (NRC, 1989).

Water-soluble molybdenum compounds are readily taken up through the lungs and gastrointestinal tract; but insoluble compounds are not. Following absorption, molybdenum is distributed throughout the body with the highest levels generally found in the liver, kidneys, spleen, and bone (Wennig and Kirsch, 1988).

Limited data suggest that 25 to 50% of an oral dose is excreted in the urine, with small amounts also eliminated in the bile. Biological half-life may vary from several hours in laboratory animals to as much as several weeks in humans (Friberg and Lener, 1986; Jarrell et al., 1980; Stokinger, 1981; Vanoeteren et al., 1982; Venugopal and Luckey, 1978).

Data documenting molybdenum toxicity in humans are limited. The physical and chemical state of the molybdenum, route of exposure, and compounding factors such as dietary copper and sulfur levels may all affect toxicity. Mild cases of molybdenosis may be clinically identifiable only by biochemical changes (e.g., increases in uric acid levels due to the role of molybdenum in the enzyme xanthine oxidase). Excessive intake of molybdenum causes a physiological copper deficiency, and conversely, in cases of inadequate dietary intake of copper, molybdenum toxicity may occur at lower exposure levels.

There is no information available on the acute or subchronic oral toxicity of molybdenum in humans. In studies conducted in a region of Armenia where levels of molybdenum in the soil are high (77 mg Mo/kg), 18% of the adults examined in one town and 31% of those in another town were found to have elevated concentrations of uric acid in the blood and urine, increased blood xanthine oxidase activity, and gout-like symptoms such as arthralgia, articular deformities, erythema, and edema (Kovalskii et al., 1961). The daily molybdenum intake was estimated to be 10-15 mg. An outbreak of genu valgum (knock-knees) in India was attributed to an increase in Mo levels in sorgum, the main staple food of the region. The estimated daily Mo intake was 1.5 mg (Jarrell et al., 1980).

In animals, acutely toxic oral doses of molybdenum result in severe gastrointestinal irritation with diarrhea, coma and death from cardiac failure. Oral LD_{50} values of 125 and 370 mg Mo/kg for molybdenum trioxide and ammonium molybdate, respectively, have been reported in laboratory rats (Venugopal and Luckey, 1978). Subchronic and chronic oral exposures can result in gastrointestinal disturbances, growth retardation, anemia, hypothyroidism, bone and joint deformities, sterility, liver and kidney abnormalities, and death (Lloyd et al., 1976; Venugopal and Luckey, 1978; Valli et al., 1969; Fairhall et al., 1945; Rana and Kumar, 1980). Fatty degeneration of the liver occurred in rabbits dosed with 50 mg/kg/day for 6 mo (Asmangulyan, 1965) and in rats dosed with 5 mg/kg/day as ammonium molybdate for 1 year (Valjcuk and Sramko, 1973). Male sterility, was reported in rats fed diets containing 80 or 140 ppm Mo (Jeter and Davis, 1954). Teratogenic effects have not been observed in mammals, but embryotoxic effects, including reduced weight gain, reduced skeletal ossification, nerve system demyelinization, and reduced survival of offspring have been reported (Wide, 1984; Earl and Vish, 1979; Schroeder and Mitchener, 1971).

Information on the inhalation toxicity of molybdenum in humans following acute and subchronic exposures is not available. Studies of workers chronically exposed to Mo indicate a high incidence of weakness, fatigue, headache, irritability, lack of appetite, epigastric pain, joint and muscle pain, weight loss, red and moist skin, tremor of the hands, sweating, and dizziness (Akopajan, 1964; Ecolajan, 1965; Walravens et al., 1979). Elevated levels of Mo in blood plasma and urine and high levels of ceruloplasmin and uric acid in blood serum were reported for workers exposed to Mo (8-hr TWA 9.5 mg Mo/m^3) (Walravens et al., 1979). Occupational exposure to molybdenum may also result in increased serum bilirubin levels and decreased blood IgA/IgG ratios due to a rise in alpha-immunoglobulins (Avakajan, 1966b; 1968). Direct pulmonary effects of chronic exposure to Mo have been reported in only one study in which 3 of 19 workers exposed to Mo and MoO_3 (1 to 19 mg/m^3) for 3-7 years were symptomatic and had X-ray findings indicative of pneumoconiosis (Mogilevskaya, 1963). Adverse reproductive or developmental effects have not been observed in molybdenum workers (Metreveli et al., 1985).

In animal studies, inhalation exposures to molybdenum compounds have resulted in respiratory tract irritation, pulmonary hemorrhages, perivascular edema, and liver and kidney damage (Mogilevskaya, 1963; Fairhall, et al., 1945). Other effects reported in animals include diarrhea, muscle incoordination,

loss of hair, loss of weight (Fairhall et al., 1945), changes in ECG, increased arterial blood pressure, increased serum lactate dehydrogenase, increased cardiac adrenaline and noradrenaline levels (Babayan et al., 1984), and inflammation of the uterine horns with necrotic foci and endometrial atrophy (Metreveli and Daneliya, 1984). Some molybdenum compounds, such as molybdenum trioxide and sodium molybdate (Na_2MoO_4) are strong eye and skin irritants; however, others, such as calcium and zinc molybdates are not primary irritants.

Subchronic and chronic Reference Concentrations (RfC) for molybdenum are not available.

Information on the oral or inhalation carcinogenicity of molybdenum compounds in humans was not available, and animal data indicate that Mo may have an inhibitory effect on esophageal (Luo et al., 1983; van Rensburg et al., 1986; Komada, et al., 1990) and mammary carcinogenesis (Wei et al., 1987). However, intraperitoneal injections of MoO_3 in mice produced a significant increase in the number of lung adenomas per mouse and an insignificant increase in the number of mice bearing tumors (Stoner et al., 1976). Molybdenum is placed in EPA Group D, not classifiable as to carcinogenicity in humans (U.S. EPA, 1990) and calculation of slope factors is not possible.

The chronic oral Reference Dose (RfD) for molybdenum and molybdenum compounds is 0.005 mg/kg/day, based on biochemical indices in humans (U.S. EPA, 1992). The subchronic RfD is also 0.005 mg/kg/day (U.S. EPA, 1992).

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D5.1.14 Nickel (CAS 007440-02-0 for soluble nickel salts) (RAIS)

Nickel is a very abundant element in the environment. It is found primarily combined with oxygen (oxides) or sulfur (sulfides), found in all soils, and is emitted from volcanoes. Pure nickel is a hard,

silvery-white metal that is combined with other metals to form alloys. Some of the metals that nickel can be alloyed with are iron, copper, chromium, and zinc. These alloys are used to make metal coins and jewelry and in industry. Nickel compounds also are used for nickel plating, to color ceramics, to make some batteries, and as substances known as catalysts that increase the rate of chemical reactions. Nickel and its compounds have no characteristic odor or taste. Nickel forms included in this profile are nickel carbonyl, CAS number 13463-39-3; nickel refinery dust, no CAS number; nickel subsulfide, CAS number 12035-72-2; and nickel soluble salts, no CAS number.

Nickel is required to maintain health in animals. A small amount of nickel probably is essential for humans, although a lack of nickel has not been found to affect the health of humans. The absorption of nickel is dependent on its physicochemical form, with water-soluble forms being more readily absorbed. The most common adverse health effect of nickel in humans is an allergic reaction. Humans can become sensitive to nickel when jewelry or other nickel-containing items are in direct contact with the skin. Once a person is sensitized to nickel, further contact will produce a reaction; the most common reaction is a skin rash at the site of contact. Less frequently, some humans who are sensitive to nickel have asthma attacks or other reactions following exposure to nickel in food, water, or dust. Lung effects, including chronic bronchitis and reduced lung function, have been observed in workers who breathed large amounts of nickel. Current levels of nickel in workplace air are much lower than in the past, and today few workers show symptoms of nickel exposure. Humans who are not sensitive to it must eat very large amounts of nickel to show adverse health effects. In large doses (>0.5 g), some forms of nickel may be acutely toxic to humans when taken orally. Workers who accidentally drank water containing very high levels of nickel (100,000 times more than in normal drinking water) had stomachaches and effects on their blood and kidneys.

Epidemiologic studies have shown that occupational inhalation exposure to nickel dust (primarily nickel subsulfide) at refineries has resulted in increased incidences of pulmonary and nasal cancer. Inhalation studies using rats also have shown nickel subsulfide or nickel carbonyl to be carcinogenic. Based on these data, the EPA has classified nickel subsulfide and nickel refinery dust in weight-of-evidence group A; human carcinogen. Based on an increased incidence of pulmonary carcinomas and malignant tumors in animals exposed to nickel carbonyl by inhalation or by intravenous injection, this compound had been placed in weight-of-evidence group B2: probable human carcinogen. The U.S. EPA has not evaluated soluble salts of nickel as a class of compounds for potential human carcinogenicity. Because the form of nickel of concern to this BHHRA was soluble salts, no slope factors were used in this BHHRA.

A chronic RfD for the oral and dermal routes of exposure from RAIS was used in the BHHRA. The RfDs used in the BHHRA for the oral and dermal routes of exposure were 2.00E-02 and 8.00E-04 mg/(kg × day), respectively. The dermal route RfD was based on a GI absorption factor of 4.00E-02.

D5.1.15 Selenium (CAS 007782-49-2) (RAIS)

Selenium is a metal commonly found in rocks and soil; much of the selenium in rocks is combined with sulfide minerals or with silver, copper, lead, and nickel minerals. Selenium and oxygen combine to form several compounds. Selenium sulfide is a bright red-yellow powder used in anti-dandruff shampoo. Industrially produced hydrogen selenide is a colorless gas with a disagreeable odor. It is probably the only selenium compound that might pose a health concern in the workplace. Selenium dioxide is an industrially produced compound that dissolves in water to form selenious acid. Selenious acid can be found in gun bluing (a solution used to clean the metal parts of a gun). Selenium is an essential trace element important in many biochemical processes that take place in human cells. Recommended human dietary allowances for selenium for adults is about 40-70 µg.

In humans, acute oral exposures can result in excessive salivation, garlic odor to the breath, shallow breathing, diarrhea, pulmonary edema, and death. Other reported signs and symptoms of acute selenosis include tachycardia, nausea, vomiting, abdominal pain, abnormal liver function, muscle aches and pains, irritability, chills, and tremors. The exact levels at which these effects occur are not known. GI absorption in animals and humans of various selenium compounds ranges from about 44% to 95% of the ingested dose. If too much selenium is ingested over long periods of time, brittle hair and deformed nails can develop. Upon contact with skin, selenium compounds have caused rashes, swelling, and pain. Respiratory tract absorption rates of 97% and 94% for aerosols of selenious acid have been reported for dogs and rats, respectively. In humans, inhalation of selenium or selenium compounds primarily affects the respiratory system. Dusts of elemental selenium and selenium dioxide can cause irritation of the skin and mucous membranes of the nose and throat, coughing, nosebleed, loss of sense of smell, dyspnea, bronchial spasms, bronchitis, and chemical pneumonia.

Studies of laboratory animals and humans show that most selenium compounds probably do not cause cancer. In fact, human studies suggest that lower-than-normal selenium levels in the diet might increase the risk of cancer. Other forms of selenium may, however, be carcinogenic according to the DHHS. Selenium sulfide produced a significant increase in the incidence of lung and liver tumors in rats and mice. EPA has placed selenium and selenious acid in Group D, not classifiable as to carcinogenicity in humans, while selenium sulfide is placed in Group B2, probable human carcinogen. Selenium sulfide is very different from the selenium compounds found in foods and in the environment. Selenium sulfide has not caused cancer in animals when it is placed on the skin, and the use of anti-dandruff shampoos containing selenium sulfide is considered safe.

Chronic RfDs from RAIS were available for selenium. The RfDs used in the BHHRA for the oral and dermal routes of exposure were 5.00E-03 mg/(kg × day), for both. The dermal route RfD was based on a GI absorption factor of 1.00E+00.

D5.1.16 Silver (CAS 97161-97-2) (RAIS)

Silver is a relatively rare metal that occurs naturally in the earth's crust and is released to the environment from various industrial sources. Human exposure to silver and silver compounds can occur orally, dermally, or by inhalation. Silver is found in most tissues, but has no known physiologic function.

In humans, accidental or intentional ingestion of large doses of silver nitrate has produced corrosive damage of the gastrointestinal tract, abdominal pain, diarrhea, vomiting, shock, convulsions, and death (U.S. EPA, 1985). Respiratory irritation was noted following acute inhalation exposure to silver or silver compounds. Silver nitrate solutions are highly irritating to the skin, mucous membranes, and eyes (Stokinger, 1981).

Ingestion, inhalation, or dermal absorption of silver may cause argyria, the most common indicator of long-term exposure to silver or silver compounds in humans. Argyria is a gray or blue-gray, permanent discoloration of the skin and mucous membranes that is not a toxic effect per se, but is considered cosmetically disfiguring. Chronic inhalation exposure of workers to silver oxide and silver nitrate dusts resulted in upper and lower respiratory irritation, deposition of granular silver-containing deposits in the eyes, impaired night vision, and abdominal pain (Rosenman et al., 1979). Mild allergic responses have been attributed to dermal contact with silver (ATSDR, 1990).

In long-term oral studies with experimental animals, silver compounds have produced slight thickening of the basement membranes of the renal glomeruli, growth depression, shortened lifespan, and granular silver-containing deposits in skin, eyes, and internal organs (Matuk et al., 1981; Olcott, 1948, 1950).

Hypoactivity was seen in rats subchronically exposed to silver nitrate in drinking water (Rungby and Danscher, 1984).

A Reference Dose (RfD) of 0.005 mg/kg/day for oral exposure was used in this BHHRA. The absorbed RfD used was 2.00E-04. The lowest-observed-adverse-effect level (LOAEL) of 0.014 mg/kg/day for argyria observed in patients receiving i.v. injections of silver arsphenamine was calculated by USEPA (U.S. EPA, 1992a,b). Data are presently insufficient to derive a Reference Concentration (RfC) for silver (U.S. EPA, 1992a). The gastrointestinal absorption factor used was 4.00E-02.

Data adequate for evaluating the carcinogenicity of silver to humans or animals by ingestion, inhalation, or other routes of exposure were not found. Based on U.S. EPA guidelines, silver is placed in weight-of-evidence group D, not classifiable as to human carcinogenicity (U.S. EPA, 1992a).

Silver references

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D5.1.17 Thallium (CAS 007440-28-0) (RAIS)

Pure thallium is a bluish-white metal that is found in trace amounts in the earth's crust. In the past, thallium was obtained as a by-product from smelting other metals; however, it has not been produced in

the United States since 1984. Currently, all the thallium is obtained from imports and from thallium reserves. In its pure form, thallium is odorless and tasteless. It can also be found combined with other substances such as bromine, chlorine, fluorine, and iodine. When it's combined, it appears colorless-to-white or yellow. The EPA has evaluated the toxicity of the following thallium compounds: thallic oxide, CAS number 1314-32-5; thallium acetate, CAS number 563-68-8; thallium carbonate, CAS number 6533-73-9; thallium chloride, CAS number 7791-12-0; thallium nitrate, CAS number 10102-45-1; thallium selenite, CAS number 12039-52-0; and thallium sulfate CAS number 7446-18-6. Thallium is used mostly in manufacturing electronic devices, switches, and closures, primarily for the semiconductor industry. It also has limited use in the manufacture of special glass and for certain medical procedures.

Exposure to high levels of thallium can result in harmful health effects. A study on workers exposed on the job over several years reported nervous system effects, such as numbness of fingers and toes, from breathing thallium. Humans who ingested large amounts of thallium over a short time have reported vomiting, diarrhea, temporary hair loss, and effects on the nervous system, lungs, heart, liver, and kidneys as well as death. It is not known what the effects are from ingesting low levels of thallium over a long time. Birth defects were not reported in the children of mothers exposed to low levels from eating vegetables and fruits contaminated with thallium. Studies in rats, however, exposed to high levels of thallium, showed adverse developmental effects.

Data suitable for evaluating the carcinogenicity of thallium to humans or animals by ingestion, inhalation, or other routes of exposure were not found. Thallium sulfate, selenite, nitrate, chloride, carbonate, acetate, and thallic oxide have been placed in EPA's weight-of evidence Group D, not classifiable as to human carcinogenicity based on inadequate human and animal data. The DHHS and the IARC, have not classified pure thallium as to its human carcinogenicity. No studies are available in humans or animals on the carcinogenic effects of breathing, ingesting, or touching thallium.

Chronic RfDs from RAIS were available for thallium chloride. The RfDs used in the BHHRA for the oral and dermal routes of exposure is 8.00E-05 (mg/kg-day), for both. The dermal route RfD was based on a GI absorption factor of 1.00E+00.

D5.1.18 Uranium (metal and soluble salts) (CAS 007440-61-1)

Uranium is a hard, silvery white amphoteric metal and is a radioactive element. In its natural state it consists of three isotopes: ^{234}U, ^{235}U, and ^{238}U. More than 100 uranium minerals exist; those of commercial importance are the oxides and oxygenous salts. The processing of uranium ore generally involves extraction then leaching either by an acid or a carbonate method. In addition, the metal may be obtained from its halides by fused salt electrolysis. The primary use of natural uranium is in nuclear energy as a fuel for nuclear reactors, in plutonium production, and as feeds for gaseous diffusion plants; it is also a source of radium salts. Uranium compounds are used in staining glass, glazing ceramics, and enameling; in photographic processes; for alloying steels; and as a catalyst for chemical reactions, radiation shielding, and aircraft counterweights (Sittig 1985).

The primary route of exposure to uranium metals and salts is through dermal contact. Uranium soluble compounds act as a poison to cause kidney damage under acute exposure and pneumoconiosis or pronounced blood changes under chronic exposure conditions. Furthermore, it is difficult to separate the toxic chemical effects of uranium and its compounds from their radiation effects. The chronic radiation effects are similar to those produced by ionizing radiation. Reports now confirm that carcinogenicity is related to dose and exposure time. Cancer of the lung, osteosarcoma, and lymphoma have all been reported (Sittig 1985). An EPA weight-of-evidence classification for uranium metal was not located in the available literature. Slope factors for uranium metal also were not available for use in the BHHRA.

Chronic RfDs from RAIS were available for uranium metal (listed as uranium soluble salts). The oral and dermal RfD used in the BHHRA was 3.00E-03 mg/(kg × day), for both. A GI absorption factor of 1.00E+00 was used to derive the dermal RfD.

D5.1.19 Vanadium (CAS 007440-62-2 for metal) (RAIS)

Vanadium is a compound that occurs in nature as a white-to-gray metal and is often found as crystals. Pure vanadium has no smell and usually combines with other elements such as oxygen, sodium, sulfur, or chloride, which greatly alter toxicity. Vanadium and vanadium compounds can be found in the earth's crust and in rocks, some iron ores, and crude petroleum deposits. Vanadium is mostly combined with other metals to make special metal mixtures called alloys. Most of the vanadium used in the United States, vanadium oxide, is used to make steel for automobile parts, springs, and ball bearings. Vanadium oxide is a yellow-orange powder, dark-gray flakes, or yellow crystals. Vanadium also is mixed with iron to make important parts for aircraft engines. Small amounts of vanadium are used in making rubber, plastics, ceramics, and other chemicals.

Exposure to high levels of vanadium can cause harmful health effects. Vanadium compounds are poorly absorbed through the digestive system (0.5-2% of dietary amount), but slightly more readily absorbed through the lungs (20-25%). The major effects from breathing high levels of vanadium are on the lungs, throat, and eyes. Workers who breathed it for short and long periods sometimes had lung irritation, coughing, wheezing, chest pain, runny nose, and a sore throat. These effects stopped soon when removed from the contaminated air. Similar effects have been observed in animal studies. No other significant health effects of vanadium have been found in humans. The health effects in humans of ingesting vanadium are not known. Animals that ingested very large doses have died. Lower, but still high, levels of vanadium in the water of pregnant animals resulted in minor birth defects. Some animals that breathed or ingested vanadium over a long term had minor kidney and liver changes.

There is no evidence that any vanadium compound is carcinogenic; however, very few adequate studies are available for evaluation. No increase in tumors was noted in a long-term animal study where the animals were exposed to vanadium in the drinking water. The DHHS, the IARC, and EPA have not classified vanadium as to its human carcinogenicity.

Chronic RfDs from RAIS were available for vanadium. The RfDs used in the BHHRA for the oral and dermal routes of exposure were 7.00E-05 and 1.820E-06 mg/(kg × day), respectively. The dermal route RfD was based on a GI absorption factor of 2.60E-02.

D5.1.20 Zinc (CAS 007440-66-6 for metal) (RAIS)

Pure zinc is a bluish-white, shiny metal. Zinc is one of the most common elements in the earth's crust and is found in air, soil, and water, and is present in all foods. Zinc has many commercial uses as coatings to prevent rust, in dry -cell batteries, and mixed with other metals to make alloys like brass and bronze. A zinc and copper alloy is used to make pennies in the United States. Zinc combines with other elements to form zinc compounds; common zinc compounds found at hazardous waste sites include zinc chloride, zinc oxide, zinc sulfate, zinc phosphide, zinc cyanide, and zinc sulfide. Zinc compounds are widely used in industry to make paint, rubber, dye, wood preservatives, and ointments.

Zinc is an essential element, with recommended daily allowances ranging from 5 mg for infants to 15 mg for adult males. Too little zinc can cause health problems, but too much zinc also is harmful.

The digestive tract absorbs 20% to 80 % of ingested zinc based on the chemical compound ingested. Harmful health effects generally begin at levels in the 100 to 250 mg/day range. Eating large amounts of

zinc, even for a short time, can cause stomach cramps, nausea, and vomiting. Taken longer, it can cause anemia, pancreas damage, and lower levels of high-density lipoprotein cholesterol (the good form of cholesterol). Breathing large amounts of zinc (as dust or fumes) can cause a specific short-term disease called metal fume fever. This is believed to be an immune response affecting the lungs and body temperature. The long-term effects of breathing high levels of zinc or the effects on human reproduction are not known. Rats that were fed large amounts of zinc became infertile or had smaller babies. Irritation also was observed on the skin of rabbits, guinea pigs, and mice when exposed to some zinc compounds. Skin irritation will probably occur in humans.

No case studies or epidemiologic evidence has been presented to suggest that zinc is carcinogenic in humans by the oral or inhalation route. In animal studies, zinc sulfate in drinking water or zinc oleate in the diet of mice for a period of one year did not result in a statistically significant increase in tumors; however, in a 3-year, 5-generation study on tumor-resistant and tumor-susceptible strains of mice, exposure to zinc in drinking water resulted in increased frequencies of tumors. EPA has placed zinc in weight-of-evidence Group D: not classifiable as to human carcinogenicity due to inadequate evidence in humans and animals. There were no slope factors available for zinc in this BHHRA.

Chronic RfDs from RAIS were available for zinc. The RfD used in the BHHRA for the oral and dermal routes of exposure was 3.00E-01 mg/(kg × day), for both. The dermal route RfD was based on a GI absorption factor of 1.00E+00.

D5.2 ORGANIC COMPOUNDS

D5.2.1 Total PCBs (high risk) (RAIS)

PCBs are inert, thermally and physically stable, and have dielectric properties. In the environment, the behavior of PCB mixtures is directly correlated to the degree of chlorination. They have been used in closed systems such as heat transfer liquids, hydraulic fluids and lubricants, and in open systems such as plasticizers, surface coatings, inks, adhesives, pesticide extenders, and for microencapsulation of dyes for carbonless duplicating papers. Aroclor is strongly sorbed to soil and remains immobile when leached with water; however, the mixture is highly mobile in the presence of organic solvents. PCBs are resistant to chemical degradation by oxidation or hydrolysis. PCBs have high bioconcentration factors and tend to accumulate in the fat of fish, birds, mammals, and humans.

PCBs are absorbed after oral, inhalation, or dermal exposure and are stored in adipose tissue. The major route of PCB excretion is in the urine and feces; however, more important is the elimination in human milk. Accidental human poisonings and data from occupational exposure to PCBs suggest initial dermal and mucosal disturbances followed by systemic effects that may manifest themselves several years post-exposure. Initial effects are enlargement and hypersecretion of the Meibomian gland of the eye, swelling of the eyelids, pigmentation of the fingernails and mucous membranes, fatigue, and nausea. These effects were followed by hyperkeratosis, darkening of the skin, acneform eruptions, edema of the arms and legs, neurological symptoms, such as headache and limb numbness, and liver disturbance.

Data are suggestive but not conclusive concerning the carcinogenicity of PCBs in humans; however, hepatocellular carcinomas in three strains of rats and two strains of mice have led the EPA to classify PCBs as group B2, probable human carcinogen.

Cancer slope factors for the total class of PCBs (based on high risk) are available from RAIS. The slope factors used in the BHHRA for the oral, inhalation, and dermal exposure routes are 2.00E+00, 2.20E+00, and 2.00E+00 $[mg/(kg \times day)]^{-1}$, respectively. The slope factor for the dermal exposure route was calculated by assuming a GI absorption factor of 90%.

Chronic RfDs for PCB-1254 are available from RAIS. This RfD was used for calculating noncarcinogenic hazard for Total PCBs. The value used in the BHHRA for the oral, and dermal routes was 2.00E-05 mg/(kg × day) for both. The dermal RfD was derived using a GI absorption factor of 90%.

D5.2.2 Total PAHs

Total PAHs are evaluated in this BRA by weighting the concentration of each PAH to convert it to benzo(a) pyrene equivalents as described in the 2001 Risk Methods Document and then evaluating the sum of the concentrations based on the toxicity of benzo(a)pyrene. The PAHs included in this calculation for the PAH class are benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene.

Benzo[a]pyrene is one of many chemicals known as PAHs. It exists as yellowish plates and needles. Benzo[a]pyrene is practically insoluble in water but is soluble in benzene, toluene, xylene and sparingly soluble in alcohol and methanol. No current commercial production or use of benzo[a]pyrene is known. It occurs ubiquitously in products of incomplete combustion and in fossil fuels. It has been identified in surface water, tap water, rain water, groundwater, waste water, and sewage sludge. Benzo[a]pyrene is primarily released to the air and removed from the atmosphere by photochemical oxidation and dry deposition to land or water. Biodegradation is the most important transformation process in soil or sediment.

No data are available on the systemic (noncarcinogenic) effects of benzo[a]pyrene in humans. Benzo[a]pyrene is readily absorbed following inhalation, oral, and dermal routes of administration. Following inhalation exposure, benzo[a]pyrene is rapidly distributed to several tissues in rats. The metabolism of benzo[a]pyrene is complex and includes the formation of a proposed ultimate carcinogen, benzo[a]pyrene 7,8 diol-9,10-epoxide. Dietary administration of doses as low as 10 mg/kg during gestation caused reduced fertility and reproductive capacity in mice offspring, and treatment by gavage with 120 mg/kg/day during gestation caused stillbirths, resorptions, and malformations.

Numerous epidemiologic studies have shown a clear association between exposure to various mixtures of PAHs containing benzo[a]pyrene (e.g., coke oven emissions, roofing tar emissions, and cigarette smoke) and increased risk of lung cancer and other tumors. Each of the mixtures also contained other potentially carcinogenic PAHs; therefore, it is not possible to evaluate the contribution of benzo[a]pyrene to the carcinogenicity of these mixtures. Based on United States EPA guidelines, benzo[a]pyrene was assigned to weight-of-evidence group B2, probable human carcinogen.

Cancer slope factors for benzo[a]pyrene are available from RAIS, and are described in the section on that chemical, as are other constants used for specific PAHs.

D5.2.3 Naphthalene (CAS 000091-20-3)

Naphthalene is a white solid that is found naturally in fossil fuels and that exhibits a typical mothball odor. Naphthalene is a polycyclic aromatic hydrocarbon composed of two fused benzene rings. Burning tobacco or wood produces naphthalene. It occurs in crude oil, from which it may be recovered directly as white flakes; it can also be isolated from cracked petroleum, coke-oven emissions, or from high-temperature carbonization of bituminous coal. The major products made from naphthalene are moth repellents. It is also used for making dyes, resins, leather, tanning agents, and the insecticide carbaryl.

Naphthalene can be absorbed by the oral, inhalation, and dermal routes of exposure and can cross the placenta in amounts sufficient to cause fetal toxicity. Exposure to large amounts of naphthalene may damage or destroy some red blood cells, causing a low level until the body replaces the destroyed cells.

People, particularly children, have developed this problem after eating naphthalene-containing mothballs or deodorant blocks. Some of the symptoms of this problem are fatigue, lack of appetite, restlessness, and pale skin. Exposure to large amounts of naphthalene may also cause neurotoxic effects (confusion, lethargy, listlessness, vertigo), gastrointestinal distress, hepatic effects (jaundice, hepatomegaly, elevated serum enzyme levels), renal effects, and ocular effects (cataracts, optical atrophy). The estimated lethal dose of naphthalene is 5-15 g for adults and 2-3 g for children. Animals sometimes develop cloudiness in their eyes after swallowing naphthalene. It is not clear if this also develops in people. When mice were repeatedly exposed to naphthalene vapors for 2 years, their noses and lungs became inflamed and irritated.

Available cancer bioassays were insufficient to assess the carcinogenicity of naphthalene. Using EPA's 1996 Proposed Guidelines for Carcinogen Risk Assessment, the human carcinogenic potential of naphthalene via the oral or inhalation routes "cannot be determined" at this time based on human and animal data. There is suggestive evidence (observations of benign respiratory tumors and one carcinoma in female mice only exposed to naphthalene by inhalation) that naphthalene may cause cancer. Additional support includes increase in respiratory tumors associated with exposure to 1-methylnaphthalene.

Chronic RfDs for naphthalene are available from RAIS. The values used in the BHHRA for the oral, inhalation, and dermal routes were 2.00E-02, 8.57E-04, and 1.60E-02 mg/(kg × day). The dermal RfD was derived using a GI absorption factor of 80%.

D5.2.4 Pyrene (CAS 000129-00-0) (RAIS)

Pyrene, also known as benzo(def)phenanthrene, is a PAH with four aromatic carbon rings. Pure pyrene is a colorless crystalline solid at ambient temperature; the presence of tetracene, a common contaminant, gives it a yellow color. Pyrene can be derived from coal tar, but there is no commercial production or known commercial use of this compound. Pyrene from coal tar has been used as the starting material for the synthesis of benzo[a]pyrene.

Human exposure to pyrene occurs primarily through inhalation of tobacco smoke and polluted air and by ingestion of water polluted by combustion effluents. Pyrene is common in the environment as a product of incomplete combustion and has been identified in water, food, and in the air. Although a large body of literature exists on the toxicity and carcinogenicity of other PAHs, toxicity data for pyrene are limited. No human data were available that addressed the toxicity of pyrene. Subchronic oral exposure to pyrene produced nephropathy, decreased kidney weights, increased liver weights, and slight hematological changes in mice and produced fatty livers in rats. A single intraperitoneal injection of pyrene produced swelling and congestion of the liver and increased serum aspartate amino transferase and bilirubin levels in rats. No data were available concerning the toxic effects of inhalation exposure to pyrene.

No oral or inhalation bioassays were available to assess the carcinogenicity of pyrene in humans. Many studies involving different routes of pyrene exposure were done on animals. None of these studies saw an increase in tumor rates, but there is evidence that pyrene enhances the tumor causing ability of benzo[a]pyrene. Based on no human data and inadequate data from animal bioassays, EPA has placed pyrene in weight-of-evidence group D, not classifiable as to human carcinogenicity.

Chronic RfDs for pyrene are available from EPA’s IRIS. The values used in the BHHRA for the oral and dermal routes were 3.00E-02 and 9.30E-03 mg/(kg × day). The dermal RfD was derived using a GI absorption factor of 31%.

D5.3 RADIONUCLIDES

Radionuclides are unstable atoms of chemical elements that will emit charged particles or energy or both to achieve a more stable state. These charged particles are termed "alpha and beta radiation"; energy is termed "neutral gamma rays." Interaction of these charged particles (and gamma rays) with matter will produce ionization events, or radiation, which may cause living cell tissue damage. Because the deposition of energy by ionizing radiation is a random process, sufficient energy may be deposited (in a critical volume) within a cell and result in cell modification or death. In addition, ionizing radiation has sufficient energy that interactions with matter will produce an ejected electron and a positively charged ion (known as free radicals) that are highly reactive and may combine with other elements, or compounds within a cell, to produce toxins or otherwise disrupt the overall chemical balance of the cell. These free radicals also can react with deoxyribonucleic acid (DNA), causing genetic damage, cancer induction, or even cell death.

Radionuclides are characterized by the type and energy level of the radiation emitted. Radiation emissions fall into two major categories: particulate (electrons, alpha particles, beta particles, and protons) or electromagnetic radiation (gamma and x-rays). Therefore, all radionuclides are classified by the EPA as Group A carcinogens based on their property of emitting ionizing radiation and on the extensive weight of evidence provided by epidemiological studies of humans with cancers induced by high doses of radiation. Alpha particles are emitted at a characteristic energy level for differing radionuclides. The alpha particle has a charge of +2 and a comparably large size. Alpha particles have the ability to react (and/or ionize) with other molecules, but they have very little penetrating power and lack the ability to pass through a piece of paper or human skin. However, alpha-emitting radionuclides are of concern when there is a potential for inhalation or ingestion of the radionuclide. Alpha particles are directly ionizing and deposit their energy in dense concentrations [termed high linear energy transfer (LET)], resulting in short paths of highly localized ionization reactions. The probability of cell damage increases as a result of the increase in ionization events occurring in smaller areas; this also may be the reason for increased cancer incidence caused by inhalation of radon gas. In addition, the cancer incidence in smokers may be directly attributed to the naturally occurring alpha emitter, polonium-210, in common tobacco products.

Beta emissions generally refer to beta negative particle emissions. Radionuclides with an excess of neutrons achieve stability by beta decay. Beta radiation, like alpha radiation, is directly ionizing but, unlike alpha activity, beta particles deposit their energy along a longer track length (low LET), resulting in more space between ionization events. Beta-emitting radionuclides can cause injury to the skin and superficial body tissue, but are most destructive when inhaled or ingested. Many beta emitters are similar chemically to naturally occurring essential nutrients and will, therefore, tend to accumulate in certain specific tissues. For example, strontium-90 is chemically similar to calcium and, as a result, accumulates in the bones, where it causes continuous exposure. The health effects of beta particle emissions depend upon the target organ. Those seeking the bones would cause a prolonged exposure to the bone marrow and affect blood cell formation, possibly resulting in leukemia, other blood disorders, or bone cancers. Those seeking the liver would result in liver diseases or cancer, while those seeking the thyroid would cause thyroid and metabolic disorders. In addition, beta radiation may lead to damage of genetic material (DNA), causing hereditary defects.

Gamma emissions are the energy that has been released from transformations of the atomic nucleus. Gamma emitters and x-rays behave similarly, but differ in their origin: gamma emissions originate in nuclear transformations, and x-rays result from changes in the orbiting electron structure. Radionuclides that emit gamma radiation can induce internal and external effects. Gamma rays have high penetrating ability in living tissue and are capable of reaching all internal body organs. Without such sufficient shielding as lead, concrete, or steel, gamma radiation can penetrate the body from the outside and does not require ingestion or inhalation to penetrate sensitive organs. Gamma rays are characterized as low-

LET radiation, as is beta radiation; however, the behavior of beta radiation differs from that of gamma radiation in that beta particles deposit most of their energy in the medium through which they pass, while gamma rays often escape the medium because of higher energies, thereby creating difficulties in determining actual internal exposure. For this reason, direct whole-body measurements are necessary to detect gamma radiation, while urine/fecal analyses are usually effective in detecting beta radiation.

People receive gamma radiation continuously from naturally occurring radioactive decay processes going on in the earth's surface, from radiation naturally occurring inside their bodies, from the atmosphere as fallout from nuclear testing or explosions, and from space or cosmic sources. Cesium-137 (from nuclear fallout) decays to barium-137, the highest contributor to fallout-induced gamma radiation. Beta radiation from the soil is a less penetrating form of radiation, but has many contributing sources. Potassium-40, ^{137}Cs, lead-214, and bismuth-214 are among the most common environmental beta emitters. Tritium is also a beta emitter but contributes little to the soil beta radiation because of the low energy of its emission and its low concentration in the atmosphere. Alpha radiation also is emitted by the soil, but is not measurable more than a few centimeters from the ground surface. The majority of alpha emissions are attributable to radon-222 and radon-220 and their decay products. This contributes to what is called background exposure to radiation.

The general health effects of radiation can be divided into stochastic (related to dose) and nonstochastic (not related to dose) effects. The risk of development of cancer from exposure to radiation is a stochastic effect. Examples of nonstochastic effects include acute radiation syndrome and cataract formation, which occur only at high levels of exposures.

Radiation can damage cells in different ways. It can cause damage to DNA within the cell, and the cell either may not be able to recover from this type of damage or may survive but function abnormally. If an abnormally functioning cell divides and reproduces, a tumor or mutation in the tissue may develop. The rapidly dividing cells that line the intestines and stomach and the blood cells in bone marrow are extremely sensitive to this damage. Organ damage results from the damage caused to the individual cells. This type of damage has been reported with doses of 10 to 500 rads (0.1 to 5.0 gray, in SI units). Acute radiation sickness is seen only after doses of >50 rads (0.5 gray), which is a dose rate usually achieved only in a nuclear accident.

When the radiation-damaged cells are reproductive cells, genetic damage can occur in the offspring of the person exposed. The developing fetus is especially sensitive to radiation. The type of malformation that may occur is related to the stage of fetal development and the cells that are differentiating at the time of exposure. Radiation damage to children exposed in the womb is related to the dose the pregnant mother receives. Mental retardation is a possible effect of fetal radiation exposure.

The most widely studied population that has had known exposure to radiation is the atomic bomb survivors of Hiroshima and Nagasaki, Japan. Data indicate an increase in the rate of leukemia and cancers in this population. However, the rate at which cancer incidence is significantly affected by low radiation exposures, such as results of exposure to natural background and industrially contaminated sites, is still undergoing study and is uncertain. In studies conducted to determine the rate of cancer and leukemia increase, as well as genetic defects, several radionuclides must be considered.

D5.3.1 Americium-241 (CAS 014596-10-2) (EPA)

Americium is a man-made metal produced when plutonium atoms absorb neutrons in nuclear reactors and in nuclear weapons detonations. Americium has several different isotopes, all of which are radioactive. The most important isotope is ^{241}Am. Americium is a silver-white, crystalline metal that is solid under normal conditions. All isotopes of americium are radioactive. Americium-241 primarily emits alpha

particles, but also emits gamma rays. A mixture of ^{241}Am and beryllium emits neutrons. Americium-241 has a half-life of 432.7 years.

People may be directly exposed to gamma radiation from ^{241}Am by walking on contaminated land. They may also be exposed to both alpha and gamma radiation by breathing in americium contaminated dust, or drinking contaminated water. Because ^{241}Am was widely dispersed globally during the testing of nuclear weapons, only very minute amounts of it are found in the soil, plants, and water. Living near a weapons testing or production facility may increase your chance of exposure to ^{241}Am. People who live or work near a contaminated site, such as a former weapons production facility, may ingest ^{241}Am with food and water, or may inhale it as part of resuspended dust.

Once in the body, ^{241}Am tends to concentrate in the bone, liver, and muscle. It can stay in the body for decades and continue to expose the surrounding tissues to radiation, and increase your risk of developing cancer.

When inhaled, some ^{241}Am remains in the lungs, depending upon the particle size and the chemical form of the americium compound. The chemical forms that dissolve easily may pass into the bloodstream from the lungs. The chemical forms that dissolve less easily tend to remain in the lungs, or are coughed up through the lung's natural defense system, and swallowed. From the stomach swallowed americium may dissolve and pass into the bloodstream. However, undissolved material passes from the body through the feces. Americium-241 poses a significant risk if ingested (swallowed) or inhaled. It can stay in the body for decades and continue to expose the surrounding tissues to both alpha and gamma radiation, increasing the risk of developing cancer.

Oral, inhalation and external exposure cancer slope factors used in the BHHRA ^{241}Am are 9.10E-11 risk/pCi, 2.81E-08 risk/pCi and 2.76E-08 risk/yr per pCi/g soil, respectively. A dermal cancer slope factor was not calculated because this route of exposure is not evaluated in the BHHRA. Oral and inhalation RfDs are available in EPA's IRIS.

D5.3.2 Cesium-137 (EPA)

Radioactive ^{137}Cs is produced when uranium and plutonium absorb neutrons and undergo fission. Examples of the uses of this process are nuclear reactors and nuclear weapons. The splitting of uranium and plutonium in fission creates numerous fission products. Cesium-137 is one of the more well-known fission products. Cesium, as well as ^{137}Cs, is a soft, malleable, silvery white metal. Cesium is one of only three metals that is a liquid near room temperature (83 °F). The half-life of ^{137}Cs is 30 years

People may also be exposed from contaminated sites: Walking on ^{137}Ce contaminated soil could result in external exposure to gamma radiation. Leaving the contaminated area would prevent additional exposure. Coming in contact with waste materials at contaminated sites could also result in external exposure to gamma radiation. Leaving the area would also end the exposure. If ^{137}Ce contaminated soil becomes air-borne as dust, breathing the dust would result in internal exposure. Because the radiation emitting material is then in the body, leaving the site would not end the exposure. Drinking ^{137}Ce contaminated water, also would place the ^{137}Ce inside the body, where it would expose living tissue to gamma and beta radiation.

People may ingest ^{137}Cs with food and water, or may inhale it as dust. If ^{137}Cs enters the body, it is distributed fairly uniformly throughout the body's soft tissues, resulting in exposure of those tissues. Slightly higher concentrations of the metal are found in muscle, while slightly lower concentrations are found in bone and fat. Compared to some other radionuclides, ^{137}Cs remains in the body for a relatively

short time. It is eliminated through the urine. Exposure to ^{137}Cs may also be external (that is, exposure to its gamma radiation from outside the body).

Like all radionuclides, exposure to radiation from ^{137}Cs results in increased risk of cancer. Everyone is exposed to very small amounts of ^{137}Cs in soil and water as a result of atmospheric fallout. Exposure to waste materials, from contaminated sites, or from nuclear accidents can result in cancer risks much higher than typical environmental exposures.

If exposures are very high, serious burns, and even death, can result. Instances of such exposure are very rare. One example of a high-exposure situation would be the mishandling a strong industrial ^{137}Cs source. The magnitude of the health risk depends on exposure conditions. These include such factors as strength of the source, length of exposure, distance from the source, and whether there was shielding between you and the source (such as metal plating).

Oral, inhalation and external exposure cancer slope factors used in the BHHRA for ^{137}Cs are 5.85E-14 risk/pCi, 4.11E-14 risk/pCi and risk/yr per pCi/g soil, respectively. A dermal cancer slope factor was not calculated because this route of exposure is not evaluated in the BHHRA. Oral and inhalation RfDs are available in EPA's IRIS.

D5.3.3 Neptunium-237 (CAS 013994-20-2)

Specific literary information for ^{237}Np is limited. However, available literature states that during neutron bombardment, ^{237}Np breaks down to ^{238}Pu , which produces small masses of high capacity energy that is useful for satellites and spacecraft (Moskalev et al. 1979).

The most common route of ^{237}Np exposure is inhalation of aerosols. According to studies conducted on rats, acute effects include injury to the liver and kidney and circulation disorders. Long-term effects include osteosarcomas and lung cancer. Extremely high doses cause immediate or premature death by destruction of the lungs (Moskalev et al. 1979).

Oral, inhalation, and external exposure cancer slope factors used in the BHHRA for ^{237}Np are 6.74E-11 risk/pCi, 1.77E-08 risk/pCi, and 7.97E-07 [(risk × g)/(pCi × yr)], respectively. The slope factors for ^{237}Np include ingrowth of short-lived degradation products. A dermal cancer slope factor was not calculated because this route of exposure is not considered significant for radionuclides and is not evaluated in the BHHRA. Oral, dermal, and inhalation RfDs are not available for this element; therefore, systemic toxicity due to exposure to ^{237}Np is not quantified in the BHHRA.

D5.3.4 Plutonium-239 (CAS 015117-48-3) (EPA)

Plutonium is created from uranium in nuclear reactors. When ^{238}U absorbs a neutron, it becomes ^{239}U which ultimately decays to ^{239}Pu. Different isotopes of uranium and different combinations of neutron absorptions and radioactive decay, create different isotopes of plutonium.

Plutonium is a silvery-grey metal that becomes yellowish when exposed to air. It is solid under normal conditions, and is chemically reactive. Plutonium has at least 15 different isotopes, all of which are radioactive. The most common ones are ^{238}Pu, ^{239}Pu, and ^{240}Pu. Plutonium-238 has a half-life of 87.7 years. Plutonium-239 has a half-life of 24,100, and ^{240}Pu has a half-life 6,560 years. The isotope ^{238}Pu gives off useable heat, because of its radioactivity.

Plutonium-239 is used to make nuclear weapons. For example, the bomb dropped on Nagasaki, Japan, in 1945, contained ^{239}Pu. The plutonium in the bomb undergoes fission in an arrangement that assures enormous energy generation and destructive potential.

All isotopes of plutonium undergo radioactive decay. As plutonium decays, it releases radiation and forms other radioactive isotopes. For example, ^{238}Pu emits an alpha particle and becomes ^{234}U; ^{239}Pu emits an alpha particle and becomes ^{235}U. This process happens slowly since the half-lives of plutonium isotopes tend to be relatively long; ^{238}Pu has a half-life of 87.7 years; ^{239}Pu has a half-life is 24,100 years, and ^{240}Pu has a half-life of 6,560 years. The decay process continues until a stable, non-radioactive element is formed.

People who live near nuclear weapons production or testing sites may have increased exposure to plutonium, primarily through particles in the air, but possibly from water as well. Plants growing in contaminated soil can absorb small amounts of plutonium.

People may inhale plutonium as a contaminant in dust. It also can be ingested with food or water. Most people have extremely low ingestion and inhalation of plutonium. However, people who live near government weapons production or testing facilities may have increased exposure. Plutonium exposure external to the body poses very little health risk.

The stomach does not absorb plutonium very well, and most plutonium swallowed with food or water passes from the body through the feces. When inhaled, plutonium can remain in the lungs depending upon its particle size and how well the particular chemical form dissolves. The chemical forms that dissolve less easily may lodge in the lungs or move out with phlegm, and either be swallowed or spit out. But, the lungs may absorb chemical forms that dissolve more easily and pass them into the bloodstream.

Once in the bloodstream, plutonium moves throughout the body and into the bones, liver, or other body organs. Plutonium that reaches body organs generally stays in the body for decades and continues to expose the surrounding tissue to radiation.

External exposure to plutonium poses very little health risk, since plutonium isotopes emit alpha radiation, and almost no beta or gamma radiation. In contrast, internal exposure to plutonium is an extremely serious health hazard. It generally stays in the body for decades, exposing organs and tissues to radiation, and increasing the risk of cancer. Plutonium is also a toxic metal, and may cause damage to the kidneys.

Oral, inhalation and external exposure cancer slope factors used in the BHHRA for ^{239}Pu are 3.33E-08 risk/pCi , 1.21E-10 risk/pCi and 2.00E-10 risk/yr per pCi/g soil, respectively. A dermal cancer slope factor was not calculated because this route of exposure is not evaluated in the BHHRA.

D5.3.5 Technetium-99 (CAS 014133-76-7) (EPA)

Technetium is a radioactive element that occurs in a number of isotopic forms. Technetium is found in some extraterrestrial material (i.e., stars); however, no appreciable amounts have been found in nature due to the relatively short half-lives of its radioactive isotopes (Kutegov et al. 1968). While no isotopes of technetium are stable, the existence of three technetium isotopes is well established. Two common forms of technetium, ^{97}Tc and ^{98}Tc, have half-lives of 2.6×10^6 and 1.5×10^6 years, respectively. The third isotope, ^{99}Tc, has a half-life of 2.12×10^5 years. None, however, possesses a half-life sufficiently long to allow technetium to occur naturally (Boyd 1959). Technetium is made artificially for industrial use, and natural technetium, particularly ^{99}Tc, has been identified and isolated from the spontaneous fission of

uranium, as well as other fissionable material or via the irradiation of molybdenum (Venugopal and Luckey 1978; Clarke and Podbielski 1988).

Technetium is an emitter of beta particles of low specific activity (Boyd 1959). It does not release nuclear energy at a rate sufficient to make the element attractive for the conventional applications of radioactivity (Boyd 1959). ^{99}Tc is the only long-lived isotope that is readily available and is the isotope on which most of the chemistry of technetium is based. Although gamma radiation has not been associated with ^{99}Tc, the secondary X rays may become important with larger amounts of the element.

Oral, inhalation, and external exposure cancer slope factors used in the BHHRA for ^{99}Tc are 2.75E-12 risk/pCi, 1.41E-11 risk/pCi, and 8.14E-11 ([risk × g]/[pCi × yr]), respectively. A dermal cancer slope factor was not calculated because this route of exposure is not evaluated in the BHHRA. Oral, dermal, and inhalation RfDs are not available for this element; therefore, systemic toxicity due to exposure to ^{99}Tc is not quantified in the BHHRA.

D5.3.6 Thorium (CAS 014274-82-9 for Thorium-228, CAS 014269-63-7 for Thorium-230, and CAS 007440-29-1 for Thorium-232, EPA and ATSDR)

Thorium is a soft, silvery white metal. Pure thorium will remain shiny for months in air, but if it contains impurities, it tarnishes to black when exposed to air. When heated, thorium oxide glows bright white, a property that makes it useful in lantern mantles. It dissolves slowly in water. Thorium-232 has a half-life of 14 billion ($14x10^9$) years, and decays by alpha emission, with accompanying gamma radiation. Thorium-232 is the top of a long decay series that contains key radionuclides such as ^{228}Ra, its direct decay product, and ^{220}Rn. Two other isotopes of thorium, which can be significant in the environment, are ^{230}Th and thorium-228 (^{228}Th). Both belong to other decay series. They also decay by alpha emission, with accompanying gamma radiation, and have half-lives of 75,400 years and 1.9 years, respectively. Only a small portion of naturally occurring thorium exists as ^{230}Th. More than 99% of natural thorium exists in the form of ^{232}Th. Thorium-230 breaks down into two parts-a small part called "alpha" radiation and a large part called the decay product. The decay product also is not stable and continues to break down through a series of decay products until a stable product is formed. During these decay processes, radioactive substances are produced. These include radium and radon. These substances give off radiation, including alpha and beta particles, and gamma radiation. The half-life for ^{230}Th is 75,400 years.

Small amounts of thorium are present in all rocks, soil, water, plants, and animals. Soil contains an average of about 6 parts of thorium per million parts of soil (6 ppm). Where high concentrations occur in rock, thorium may be mined and refined, producing waste products such as mill tailings. If not properly controlled, wind and water can introduce the tailings into the wider environment. Commercial and federal facilities that have processed thorium also may have released thorium to the air, water, or soil. Man-made thorium isotopes are rare and almost never enter the environment.

Since thorium is naturally present in the environment, people are exposed to tiny amounts in air, food, and water. The amounts usually are very small and pose little health hazard. Thorium is also present in many consumer products such as ceramic glazes, lantern mantles, and welding rods. People who live near a facility that mines or mills thorium or manufactures products with thorium may receive higher exposures. Also, people who work with thorium in various industries may receive higher exposures.

People may inhale contaminated dust, or swallow thorium with food or water. Living near a thorium-contaminated site or working in an industry where thorium is used increases the chance of exposure to thorium.

If inhaled as dust, some thorium may remain in the lungs for long periods of time, depending on the chemical form. If ingested, thorium typically leaves the body through feces and urine within several days. The small amount of thorium left in the body will enter the bloodstream and be deposited in the bones where it may remain for many years. There is some evidence that the body may absorb thorium through the skin, but that would not likely be the primary means of entry.

The principal concern from low to moderate level exposure to ionizing radiation is increased risk of cancer. Studies have shown that inhaling thorium dust causes an increased risk of developing lung cancer and cancer of the pancreas. Bone cancer risk also is increased because thorium may be stored in bone.

Oral, inhalation, and external exposure cancer slope factors used in the BHHRA for ^{228}Th are 1.32E-07 risk/pCi , 6.40E-11 risk/pCi and 7.76E-06 risk/yr per pCi/g soil, respectively. A dermal cancer slope factor was not calculated because this route of exposure is not evaluated in the BHHRA. Oral and inhalation RfDs are available in EPA's IRIS. Oral, inhalation, and external exposure cancer slope factors used in the BHHRA for ^{230}Th are 9.10E-11 risk/pCi, 2.85E-08 risk/pCi, and 8.19E-10 (risk × g)/(pCi × yr), respectively. A dermal cancer slope factor was not calculated because this route of exposure is not considered significant for radionuclides and is not evaluated in the BHHRA. Oral, dermal, and inhalation RfDs are not available for this element; therefore, systemic toxicity due to exposure to americium is not quantified in the BHHRA. Oral and inhalation exposure cancer slope factors used in the BHHRA for ^{232}Th are 8.47E-11 risk/pCi and 4.33E-08 risk/pCi, respectively. A dermal cancer slope factor was not calculated because this route of exposure is not evaluated in the BHHRA.

D5.3.7 Uranium (CAS 007440-62-2 for metal, CAS 013966-29-5 for Uranium-234, CAS 015117-96-1 for Uranium-235, and CAS 007440-61-1 for Uranium-238) (ATSDR)

Uranium is a mildly radioactive element that occurs widely in the earth's crust. It is found in all soils, most rocks, and, in lesser concentrations, in water, vegetation, and animals, including humans. Uranium emits a low level of alpha particles and a much lower level of gamma rays. Alpha particles are unable to penetrate skin, but can travel short distances in the body if ingested or inhaled. Consequently, uranium represents a significant carcinogenic hazard only when taken into the body, where alpha particle energy is absorbed by small volumes of tissue. Although the penetrating (gamma) radiation of uranium is not considered to be significant (ATSDR 1989), one of its daughter radionuclides is a strong gamma emitter; therefore, gamma radiation may be a concern in areas containing uranium.

Natural uranium contains the uranium isotopes ^{238}U (which averages 99.27% of total uranium mass), ^{235}U (0.725), and ^{234}U (0.0056%), each of which undergoes radioactive decay. Natural uranium, therefore, contains the radionuclide daughter products from the decay of ^{238}U and ^{235}U (Bowen 1979; ATSDR 1989). The half-lives of the isotopes are 200,000, 700 million, and 5 billion years for ^{234}U, ^{235}U, and ^{238}U, respectively.

Uranium is a radioactive element, but it also is a metallic element. Toxicological effects from the ingestion of uranium are the result of the action of uranium as a metal and its radioactive properties. The primary toxic chemical effect of uranium is seen in kidney damage. Studies in rabbits, mice, and dogs showed effects on the kidney to be dose-related. Fetal skeletal abnormalities and fetal death were found in pregnant mice exposed to 6 mg/kg or uranyl acetate dihydrate.

The primary human exposure studies to uranium have been studies of uranium miners or uranium factory workers. These studies have shown an increase in lung cancer deaths among these workers, which may be attributable to the decay of uranium into radon and its daughters. These workers are exposed to high levels of uranium dust and fumes and other radioactive elements in confined conditions (ATSDR 1989).

Oral, inhalation, and external exposure cancer slope factors used in the BHHRA for ^{234}U are 7.00E-11 risk/pCi, 1.14E-08 risk/pCi, and 2.52E-10 ([risk × g]/[pCi × yr]), respectively. Oral, inhalation, and external exposure cancer slope factors used in the BHHRA for ^{238}U are 8.71E-11 risk/pCi, 9.25E-09 risk/pCi, and 1.14E-07 [(risk × g)/(pCi × yr)], respectively. The slope factors for ^{238}U include ingrowth of short-lived degradation products. A dermal cancer slope factor was not calculated for the uranium isotopes because this route of exposure is not considered significant for radionuclides and is not evaluated in the BHHRA. Oral, dermal, and inhalation RfDs are available for uranium and are listed earlier in this section.

ATTACHMENT D6

RISK SUMMARIES

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Table D6.1. Summary of Risk Characterization for SWMU 1, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.49E-05	Cesium-137 Neptunium-237 Thorium-230 Uranium-238	46.0 9.9 21.4 7.8	Ingestion Inhalation Dermal External Exposure	23.7 5.3 5.4 65.6	<1	*no COCs			
Outdoor Worker - surface	3.35E-05	Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-238	15.3 3.7 3.2 11.3 59.8 5.0	Ingestion Inhalation Dermal External Exposure	74.9 1.8 1.8 21.6	<1	*no COCs			
Outdoor Worker - subsurface	6.08E-05	Arsenic Cesium-137 Neptunium-237 Plutonium-239/240 Thorium-230 Trichloroethene Uranium-238	26.7 8.4 2.0 6.2 33.0 18.3 2.8	Ingestion Inhalation Dermal External Exposure	62.1 18.1 7.8 11.9	<1	Arsenic Cobalt	14.2 25.6	Ingestion Inhalation Dermal	51.3 4.0 44.8

Table D6.1. Summary of Risk Characterization for SWMU 1, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.72E-05	Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-235 Uranium-238	51.5 11.1 4.1 3.3 18.3 2.0 8.5	Ingestion Inhalation Dermal External Exposure	21.6 1.9 3.1 73.3	<1	Beryllium	95.3	Ingestion Inhalation Dermal	2.6 0.2 97.2
Future Child Resident - surface	6.72E-05	Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-235 Uranium-238	51.5 11.1 4.1 3.3 18.3 2.0 8.5	Ingestion Inhalation Dermal External Exposure	21.6 1.9 3.1 73.3	<1	Beryllium	92.9	Ingestion Inhalation Dermal	9.7 0.4 89.9
Future Teen Recreational User - surface	3.14E-06	Cesium-137	45.8	Ingestion Inhalation Dermal External Exposure	12.7 3.9 18.0 65.3	<1	Beryllium	96.0	Ingestion Inhalation Dermal	0.4 0.1 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.2. Summary of Risk Characterization for SWMU 1, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	9.96E-06	PCB, Total	96.2	Ingestion Inhalation Dermal External Exposure	6.3 10.6 83.1	<1	*no COCs			
Future Industrial Worker - surface	1.78E-04	Chromium PCB, Total	3.8 96.2	Ingestion Inhalation Dermal External Exposure	6.3 10.6 83.1	1.37	Beryllium Mercury Nickel Silver	14.0 48.1 9.8 22.5	Ingestion Inhalation Dermal	2.0 0.1 97.9
Outdoor Worker - surface	2.03E-04	Chromium PCB, Total	2.4 97.6	Ingestion Inhalation Dermal External Exposure	39.3 6.9 53.8	1.19	Beryllium Mercury Nickel Silver	13.0 46.3 9.1 20.9	Ingestion Inhalation Dermal	16.4 0.1 83.5
Outdoor Worker - subsurface	1.28E-03	Arsenic Chromium PCB, Total Trichloroethene Vinyl chloride	1.5 0.2 15.4 81.3 1.5	Ingestion Inhalation Dermal External Exposure	9.7 75.8 14.5	46.35	Arsenic cis-1,2-Dichloroeth Mercury Silver Trichloroethene	0.3 88.9 1.4 1.2 7.2	Ingestion Inhalation Dermal	11.4 59.7 28.9

Table D6.2. Summary of Risk Characterization for SWMU 1, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.60E-05	PCB, Total Trichloroethene	15.4 81.3	See Outdoor Worker (subsurface)		14.49	cis-1,2-Dichloroeth Mercury Silver Trichloroethene	88.9 1.4 1.2 7.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.16E-04	Chromium PCB, Total	2.5 97.5	Ingestion Inhalation Dermal External Exposure	19.5 7.1 73.4	2.36	Beryllium Mercury Nickel Silver	13.9 48.0 9.7 22.3	Ingestion Inhalation Dermal	3.3 0.1 96.7
Future Child Resident - surface	5.16E-04	Chromium PCB, Total	2.5 97.5	Ingestion Inhalation Dermal External Exposure	19.5 7.1 73.4	5.95	Beryllium Cadmium Mercury Nickel Silver Thallium Vanadium	13.3 2.2 46.8 9.3 21.4 1.7 2.0	Ingestion Inhalation Dermal	12.1 0.1 87.8
Future Teen Recreational User - surface	1.09E-04	Chromium PCB, Total	1.1 98.9	Ingestion Inhalation Dermal External Exposure	1.9 3.2 94.9	1.96	Beryllium Mercury Nickel Silver	14.1 48.4 9.8 22.7	Ingestion Inhalation Dermal	0.5 0.0 99.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.3. Summary of Risk Characterization for SWMU 1, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.65E-06	PCB, Total Uranium-238	43.6 38.3	Ingestion Inhalation Dermal External Exposure	7.1 21.3 37.6 33.9	<1	*no COCs			
Outdoor Worker - surface	3.17E-06	PCB, Total Uranium-238	42.2 46.6	Ingestion Inhalation Dermal External Exposure	42.5 13.2 23.3 21.0	<1	*no COCs			
Outdoor Worker - subsurface	1.78E-05	Arsenic PCB, Total Uranium-238	84.5 7.2 8.3	Ingestion Inhalation Dermal External Exposure	72.7 0.4 23.1 3.7	<1	*no COCs			

Table D6.3. Summary of Risk Characterization for SWMU 1, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.33E-06	PCB, Total Uranium-238	36.4 53.6	Ingestion Inhalation Dermal External Exposure	12.2 11.7 27.4 48.6	<1	*no COCs			
Future Child Resident - surface	9.33E-06	PCB, Total Uranium-238	36.4 53.6	Ingestion Inhalation Dermal External Exposure	12.2 11.7 27.4 48.6	<1	*no COCs			
Future Teen Recreational User - surface	1.02E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.4. Summary of Risk Characterization for SWMU 1, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.39E-06	Chromium Cobalt-60	57.2 23.1	Ingestion Inhalation Dermal External Exposure	6.7 58.7 11.1 23.5	<1	Nickel	79.7	Ingestion Inhalation Dermal	1.0 0.4 98.6
Outdoor Worker - surface	6.30E-06	Chromium Thorium-230	36.2 36.4	Ingestion Inhalation Dermal External Exposure	40.9 37.2 7.0 14.8	<1	*no COCs			
Outdoor Worker - subsurface	1.15E-05	Cesium-137 Chromium Thorium-230 Trichloroethene	25.4 15.1 19.9 26.6	Ingestion Inhalation Dermal External Exposure	22.5 39.9 4.3 33.2	<1	*no COCs			

Table D6.4. Summary of Risk Characterization for SWMU 1, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.57E-05	Chromium Cobalt-60 PCB, Total Thorium-230	38.1 40.0 13.0 9.0	Ingestion Inhalation Dermal External Exposure	10.7 39.0 9.8 40.5	<1	Nickel	79.7	Ingestion Inhalation Dermal	1.6 0.2 98.1
Future Child Resident - surface	1.57E-05	Chromium Cobalt-60 PCB, Total Thorium-230	38.1 40.0 13.0 9.0	Ingestion Inhalation Dermal External Exposure	10.7 39.0 9.8 40.5	<1	Nickel	80.0	Ingestion Inhalation Dermal	6.3 0.5 93.3
Future Teen Recreational User - surface	1.30E-06	*no COCs				<1	Nickel	79.6	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.5. Summary of Risk Characterization for SWMU 1, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.11E-06	PCB, Total Total PAH	46.2 53.4	Ingestion Inhalation Dermal External Exposure	7.1 3.8 89.1	<1	Beryllium	66.4	Ingestion Inhalation Dermal	1.2 0.4 98.4
Outdoor Worker - surface	3.70E-06	PCB, Total Total PAH	45.0 54.8	Ingestion Inhalation Dermal External Exposure	42.2 2.4 55.5	<1	Beryllium	65.4	Ingestion Inhalation Dermal	10.8 0.3 88.9
Outdoor Worker - subsurface	4.40E-05	Arsenic PCB, Total Total PAH	91.5 3.8 4.6	Ingestion Inhalation Dermal External Exposure	74.2 0.3 25.4	<1	Arsenic Beryllium Cobalt Manganese	26.4 16.4 26.1 11.6	Ingestion Inhalation Dermal	51.5 4.4 44.1

Table D6.5. Summary of Risk Characterization for SWMU 1, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.31E-06	PCB, Total Total PAH	45.4 54.3	Ingestion Inhalation Dermal External Exposure	21.1 2.5 76.4	<1	Beryllium Nickel	66.3 32.6	Ingestion Inhalation Dermal	2.0 0.2 97.8
Future Child Resident - surface	9.31E-06	PCB, Total Total PAH	45.4 54.3	Ingestion Inhalation Dermal External Exposure	21.1 2.5 76.4	1.21	Beryllium Nickel	65.7 32.3	Ingestion Inhalation Dermal	7.8 0.4 91.8
Future Teen Recreational User - surface	2.00E-06	Total PAH	54.7	Ingestion Inhalation Dermal External Exposure	2.0 1.1 96.9	<1	Beryllium Nickel	66.5 32.6	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.6. Summary of Risk Characterization for SWMU 99

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.06E-06	Chromium	59.6	Ingestion Inhalation Dermal External Exposure	2.0 59.9 38.1	1.33	Mercury Nickel	79.9 12.4	Ingestion Inhalation Dermal	1.4 0.1 98.6
Outdoor Worker - surface	2.66E-06	Chromium	50.8	Ingestion Inhalation Dermal External Exposure	16.6 51.0 32.4	1.10	Mercury Nickel	80.4 12.1	Ingestion Inhalation Dermal	11.8 0.1 88.1
Outdoor Worker - subsurface	2.68E-05	Arsenic Chromium	89.4 5.8	Ingestion Inhalation Dermal External Exposure	70.7 5.8 20.3 3.2	1.43	Arsenic Mercury Nickel	10.5 61.7 11.2	Ingestion Inhalation Dermal	22.8 1.0 76.2

Table D6.6. Summary of Risk Characterization for SWMU 99 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	61.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.69E-06	Chromium Cobalt-60 Uranium-238	36.6 35.1 28.2	Ingestion Inhalation Dermal External Exposure	2.6 36.8 60.7	2.27	Mercury Nickel Silver	80.0 12.3 7.2	Ingestion Inhalation Dermal	2.3 0.0 97.7
Future Child Resident - surface	9.69E-06	Chromium Cobalt-60 Uranium-238	36.6 35.1 28.2	Ingestion Inhalation Dermal External Exposure	2.6 36.8 60.7	5.57	Mercury Nickel Silver	80.3 12.2 7.1	Ingestion Inhalation Dermal	8.6 0.1 91.3
Future Teen Recreational User - surface	<1E-6	*no COCs				1.91	Mercury Nickel Silver	79.9 12.4 7.2	Ingestion Inhalation Dermal	0.4 0.0 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.7. Summary of Risk Characterization for SWMU 99, Pipeline Borings

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface	1.12E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			

Table D6.7. Summary of Risk Characterization for SWMU 99, Pipeline Borings (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

There are no surface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.8. Summary of Risk Characterization for SWMU 194, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.29E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	1.05	Mercury Nickel Silver	71.2 13.0 9.7	Ingestion Inhalation Dermal	1.5 0.1 98.5
Outdoor Worker - surface	<1E-6	*no COCs				<1	Mercury Nickel	71.2 12.6	Ingestion Inhalation Dermal	12.4 0.1 87.5
Outdoor Worker - subsurface	2.58E-05	Arsenic Chromium	95.1 4.9	Ingestion Inhalation Dermal External Exposure	73.5 4.9 21.6	1.11	Arsenic Mercury Nickel	13.8 56.1 10.4	Ingestion Inhalation Dermal	25.3 1.0 73.8

Table D6.8. Summary of Risk Characterization for SWMU 194, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	56.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.50E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	1.80	Antimony Mercury Nickel Silver	5.7 71.2 13.0 9.7	Ingestion Inhalation Dermal	2.4 0.0 97.6
Future Child Resident - surface	2.50E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	4.42	Antimony Mercury Nickel Silver	6.1 71.2 12.8 9.5	Ingestion Inhalation Dermal	9.0 0.1 90.9
Future Teen Recreational User - surface	<1E-6	*no COCs				1.51	Mercury Nickel Silver	71.2 13.0 9.7	Ingestion Inhalation Dermal	0.4 0.0 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.9. Summary of Risk Characterization for SWMU 194, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.81E-06	Chromium	70.3	Ingestion Inhalation Dermal External Exposure	3.3 70.4 26.3	<1	Silver	81.2	Ingestion Inhalation Dermal	3.3 0.1 96.6
Outdoor Worker - surface	2.67E-06	Chromium Uranium-238	54.7 45.3	Ingestion Inhalation Dermal External Exposure	24.8 54.8 20.5	<1	*no COCs			
Outdoor Worker - subsurface	2.71E-05	Arsenic Chromium Uranium-238	90.7 5.4 3.9	Ingestion Inhalation Dermal External Exposure	72.2 5.5 20.6 1.8	1.05	Arsenic Mercury Silver	14.6 60.7 9.9	Ingestion Inhalation Dermal	27.4 1.1 71.5

Table D6.9. Summary of Risk Characterization for SWMU 194, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	60.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.94E-06	Chromium Uranium-238	48.3 51.7	Ingestion Inhalation Dermal External Exposure	4.7 48.3 46.9	<1	Silver	80.0	Ingestion Inhalation Dermal	5.4 0.0 94.6
Future Child Resident - surface	7.94E-06	Chromium Uranium-238	48.3 51.7	Ingestion Inhalation Dermal External Exposure	4.7 48.3 46.9	<1	Silver Uranium	72.3 23.7	Ingestion Inhalation Dermal	18.8 0.1 81.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Silver	82.6	Ingestion Inhalation Dermal	0.9 0.0 99.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.10. Summary of Risk Characterization for SWMU 194, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.74E-05	Arsenic Chromium	84.4 7.4	Ingestion Inhalation Dermal External Exposure	22.8 7.6 65.7 3.8	<1	Nickel	54.6	Ingestion Inhalation Dermal	9.6 0.7 89.7
Outdoor Worker - surface	3.81E-05	Arsenic Uranium-238	92.5 2.9	Ingestion Inhalation Dermal External Exposure	74.0 2.6 22.2 1.3	<1	Arsenic Nickel	59.5 32.6	Ingestion Inhalation Dermal	50.5 0.4 49.1
Outdoor Worker - subsurface	3.97E-05	Arsenic Cesium-137 Chromium	87.5 5.1 3.1	Ingestion Inhalation Dermal External Exposure	69.8 3.1 20.8 6.2	<1	Arsenic Nickel	59.9 32.9	Ingestion Inhalation Dermal	50.6 0.4 49.0

Table D6.10. Summary of Risk Characterization for SWMU 194, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.04E-05	Arsenic Chromium Total PAH Uranium-238	88.3 3.6 2.9 5.3	Ingestion Inhalation Dermal External Exposure	49.9 3.7 41.6 4.8	<1	Arsenic Nickel	37.0 51.8	Ingestion Inhalation Dermal	15.0 0.4 84.7
Future Child Resident - surface	7.04E-05	Arsenic Chromium Total PAH Uranium-238	88.3 3.6 2.9 5.3	Ingestion Inhalation Dermal External Exposure	49.9 3.7 41.6 4.8	1.65	Antimony Arsenic Nickel	7.6 53.9 37.4	Ingestion Inhalation Dermal	41.6 0.5 57.9
Future Teen Recreational User - surface	9.08E-06	Arsenic	90.9	Ingestion Inhalation Dermal External Exposure	7.9 2.7 87.9 1.5	<1	Arsenic Nickel	29.2 58.5	Ingestion Inhalation Dermal	2.7 0.2 97.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.11. Summary of Risk Characterization for SWMU 194, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.86E-06	Chromium Total PAH Uranium-238	41.6 31.9 26.3	Ingestion Inhalation Dermal External Exposure	5.4 41.9 29.5 23.3	1.27	Mercury Nickel Silver	78.2 12.7 8.6	Ingestion Inhalation Dermal	1.4 0.1 98.6
Outdoor Worker - surface	4.17E-06	Chromium Total PAH Uranium-238	28.5 36.1 35.4	Ingestion Inhalation Dermal External Exposure	35.2 28.7 20.2 16.0	1.05	Mercury Nickel	78.8 12.4	Ingestion Inhalation Dermal	11.8 0.1 88.2
Outdoor Worker - subsurface	2.87E-05	Arsenic Cesium-137 Chromium	85.8 4.3 4.8	Ingestion Inhalation Dermal External Exposure	68.9 4.8 20.6 5.7	1.47	Arsenic Iron Mercury Nickel	10.4 9.2 56.1 10.4	Ingestion Inhalation Dermal	27.1 0.7 72.2

Table D6.11. Summary of Risk Characterization for SWMU 194, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	56.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.19E-05	Chromium Total PAH Uranium-238	26.2 31.6 42.1	Ingestion Inhalation Dermal External Exposure	10.9 26.4 24.5 38.2	2.17	Mercury Nickel Silver	78.3 12.7 8.6	Ingestion Inhalation Dermal	2.2 0.0 97.7
Future Child Resident - surface	1.19E-05	Chromium Total PAH Uranium-238	26.2 31.6 42.1	Ingestion Inhalation Dermal External Exposure	10.9 26.4 24.5 38.2	5.32	Mercury Nickel Silver	78.6 12.5 8.5	Ingestion Inhalation Dermal	8.5 0.1 91.4
Future Teen Recreational User - surface	1.31E-06	*no COCs				1.82	Mercury Nickel Silver	78.2 12.7 8.7	Ingestion Inhalation Dermal	0.4 0.0 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.12. Summary of Risk Characterization for SWMU 194, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.74E-06	Chromium	55.5	Ingestion Inhalation Dermal External Exposure	4.4 55.9 13.5 26.2	1.26	Mercury Nickel Silver	76.5 14.0 9.2	Ingestion Inhalation Dermal	1.4 0.1 98.6
Outdoor Worker - surface	2.79E-06	Chromium Uranium-238	40.2 42.1	Ingestion Inhalation Dermal External Exposure	30.7 40.5 9.8 19.0	1.04	Mercury Nickel	77.1 13.6	Ingestion Inhalation Dermal	11.7 0.1 88.2
Outdoor Worker - subsurface	3.50E-05	Arsenic Chromium Total PAH	66.9 3.9 26.5	Ingestion Inhalation Dermal External Exposure	64.8 4.0 30.0 1.2	1.36	Arsenic Mercury Nickel	10.8 59.4 10.5	Ingestion Inhalation Dermal	24.0 1.9 74.1

Table D6.12. Summary of Risk Characterization for SWMU 194, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	59.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.17E-06	Chromium Total PAH Uranium-238	36.1 14.9 48.8	Ingestion Inhalation Dermal External Exposure	7.8 36.3 11.6 44.3	2.16	Mercury Nickel Silver	76.5 13.9 9.1	Ingestion Inhalation Dermal	2.2 0.0 97.7
Future Child Resident - surface	8.17E-06	Chromium Total PAH Uranium-238	36.1 14.9 48.8	Ingestion Inhalation Dermal External Exposure	7.8 36.3 11.6 44.3	5.30	Mercury Nickel Silver	76.9 13.7 9.0	Ingestion Inhalation Dermal	8.5 0.1 91.4
Future Teen Recreational User - surface	<1E-6	*no COCs				1.82	Mercury Nickel Silver	76.4 13.9 9.2	Ingestion Inhalation Dermal	0.4 0.0 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.13. Summary of Risk Characterization for SWMU 194, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.01E-06	Chromium	61.0	Ingestion Inhalation Dermal External Exposure	4.3 61.5 34.2	<1	Nickel	57.7	Ingestion Inhalation Dermal	2.1 7.6 90.3
Outdoor Worker - surface	2.04E-06	Uranium-238	55.2	Ingestion Inhalation Dermal External Exposure	30.2 44.9 24.9	<1	Nickel	53.4	Ingestion Inhalation Dermal	16.8 6.5 76.7
Outdoor Worker - subsurface	<1E-6					<1	Nickel	47.7	Ingestion Inhalation Dermal	19.3 8.4 72.4

Table D6.13. Summary of Risk Characterization for SWMU 194, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.21E-06	Chromium Uranium-238	38.3 61.4	Ingestion Inhalation Dermal External Exposure	5.6 38.6 55.8	<1	Nickel Silver	59.2 29.0	Ingestion Inhalation Dermal	3.5 4.3 92.3
Future Child Resident - surface	6.21E-06	Chromium Uranium-238	38.3 61.4	Ingestion Inhalation Dermal External Exposure	5.6 38.6 55.8	1.43	Manganese Nickel Silver	18.0 54.3 26.5	Ingestion Inhalation Dermal	12.3 7.6 80.2
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	61.4 30.1	Ingestion Inhalation Dermal	0.6 2.1 97.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.14. Summary of Risk Characterization for SWMU 194, EU 7

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.77E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	59.5 38.4	Ingestion Inhalation Dermal	1.0 0.3 98.7
Outdoor Worker - surface	1.31E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	59.6	Ingestion Inhalation Dermal	9.1 0.3 90.6
Outdoor Worker - subsurface	2.59E-05	Arsenic Chromium	94.9 5.0	Ingestion Inhalation Dermal External Exposure	73.3 5.1 21.5	<1	Arsenic Nickel	35.1 33.2	Ingestion Inhalation Dermal	36.6 3.2 60.2

Table D6.14. Summary of Risk Characterization for SWMU 194, EU 7 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.44E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	59.5 38.4	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	3.44E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	1.25	Nickel Silver	59.6 38.4	Ingestion Inhalation Dermal	6.5 0.3 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	59.4 38.5	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.15. Summary of Risk Characterization for SWMU 194, EU 8

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.12E-05	Chromium Total PAH	15.9 73.4	Ingestion Inhalation Dermal External Exposure	6.7 16.0 70.8 6.5	<1	*no COCs			
Outdoor Worker - surface	1.30E-05	Chromium Total PAH Uranium-238	10.1 76.8 9.1	Ingestion Inhalation Dermal External Exposure	40.8 10.2 44.9 4.1	<1	*no COCs			
Outdoor Worker - subsurface	3.94E-05	Arsenic Cesium-137 Chromium Total PAH Uranium-238	66.5 6.1 3.8 19.6 2.6	Ingestion Inhalation Dermal External Exposure	62.1 4.0 26.7 7.2	<1	Arsenic Cobalt Nickel	26.9 38.1 18.7	Ingestion Inhalation Dermal	54.5 4.1 41.4

Table D6.15. Summary of Risk Characterization for SWMU 194, EU 8 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.36E-05	Bis(2-ethylhexyl)p Chromium Total PAH Uranium-238	3.6 10.2 74.2 11.9	Ingestion Inhalation Dermal External Exposure	18.6 10.3 60.3 10.8	<1	*no COCs			
Future Child Resident - surface	3.36E-05	Bis(2-ethylhexyl)p Chromium Total PAH Uranium-238	3.6 10.2 74.2 11.9	Ingestion Inhalation Dermal External Exposure	18.6 10.3 60.3 10.8	<1	Manganese	79.9	Ingestion Inhalation Dermal	34.8 32.2 33.0
Future Teen Recreational User - surface	6.13E-06	Total PAH	88.0	Ingestion Inhalation Dermal External Exposure	2.1 5.3 90.1 2.5	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.16. Summary of Risk Characterization for SWMU 194, EU 9

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.32E-05	Arsenic Chromium	87.0 13.0	Ingestion Inhalation Dermal External Exposure	22.7 13.2 64.1	<1	*no COCs			
Outdoor Worker - surface	2.88E-05	Arsenic Chromium	95.6 4.4	Ingestion Inhalation Dermal External Exposure	73.9 4.4 21.7	<1	Arsenic	97.4	Ingestion Inhalation Dermal	75.1 0.4 24.6
Outdoor Worker - subsurface	2.47E-05	Arsenic Chromium	95.5 4.5	Ingestion Inhalation Dermal External Exposure	73.8 4.5 21.7	<1	Arsenic Nickel	39.5 30.3	Ingestion Inhalation Dermal	38.9 2.7 58.4

Table D6.16. Summary of Risk Characterization for SWMU 194, EU 9 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.18E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.8 6.5 41.8	<1	Arsenic	93.2	Ingestion Inhalation Dermal	34.2 0.5 65.3
Future Child Resident - surface	5.18E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.8 6.5 41.8	<1	Arsenic	96.6	Ingestion Inhalation Dermal	67.8 0.5 31.7
Future Teen Recreational User - surface	6.76E-06	Arsenic	95.4	Ingestion Inhalation Dermal External Exposure	8.1 4.7 87.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.17. Summary of Risk Characterization for SWMU 194, EU 10

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.42E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.54E-05	Arsenic Cesium-137 Chromium Total PAH	48.1 26.6 4.7 17.1	Ingestion Inhalation Dermal External Exposure	14.3 4.9 51.2 29.6	<1	Nickel	68.7	Ingestion Inhalation Dermal	8.4 0.7 90.9
Outdoor Worker - surface	4.18E-05	Arsenic Cesium-137 Total PAH Uranium-238	70.1 12.1 12.7 3.0	Ingestion Inhalation Dermal External Exposure	61.5 2.2 23.0 13.3	<1	Arsenic Nickel	55.5 43.5	Ingestion Inhalation Dermal	46.8 0.4 52.8
Outdoor Worker - subsurface	3.94E-05	Arsenic Cesium-137 Chromium Total PAH Uranium-238	67.4 12.8 3.1 13.5 3.2	Ingestion Inhalation Dermal External Exposure	59.9 3.2 22.8 14.1	1.09	Arsenic Mercury Nickel	15.2 68.6 13.1	Ingestion Inhalation Dermal	23.3 0.1 76.6

Table D6.17. Summary of Risk Characterization for SWMU 194, EU 10 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	68.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.06E-04	Arsenic Cesium-137 Chromium Total PAH Uranium-238	48.9 32.2 2.2 12.5 4.1	Ingestion Inhalation Dermal External Exposure	30.3 2.3 31.6 35.9	<1	Arsenic Nickel	32.8 65.6	Ingestion Inhalation Dermal	13.2 0.4 86.5
Future Child Resident - surface	1.06E-04	Arsenic Cesium-137 Chromium Total PAH Uranium-238	48.9 32.2 2.2 12.5 4.1	Ingestion Inhalation Dermal External Exposure	30.3 2.3 31.6 35.9	1.49	Arsenic Nickel	49.7 49.2	Ingestion Inhalation Dermal	38.1 0.5 61.4
Future Teen Recreational User - surface	1.15E-05	Arsenic Cesium-137 Total PAH	59.5 12.3 24.8	Ingestion Inhalation Dermal External Exposure	5.7 2.0 78.7 13.7	<1	Nickel	72.8	Ingestion Inhalation Dermal	2.4 0.2 97.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.18. Summary of Risk Characterization for SWMU 194, EU 11

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.88E-06	Chromium Total PAH	37.6 46.6	Ingestion Inhalation Dermal External Exposure	4.5 39.1 56.4	1.26	Mercury Nickel Silver	71.3 18.6 9.8	Ingestion Inhalation Dermal	1.3 0.1 98.6
Outdoor Worker - surface	2.97E-06	Total PAH	55.3	Ingestion Inhalation Dermal External Exposure	31.3 28.1 40.6	1.04	Mercury Nickel	71.9 18.2	Ingestion Inhalation Dermal	11.6 0.1 88.3
Outdoor Worker - subsurface	2.95E-05	Arsenic Chromium Total PAH	88.0 4.7 5.6	Ingestion Inhalation Dermal External Exposure	71.1 4.9 24.0	1.23	Arsenic Mercury Nickel	13.2 60.9 15.4	Ingestion Inhalation Dermal	21.3 0.1 78.6

Table D6.18. Summary of Risk Characterization for SWMU 194, EU 11 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	60.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.53E-06	Chromium PCB, Total Total PAH	27.9 17.5 54.3	Ingestion Inhalation Dermal External Exposure	15.6 29.1 55.4	2.16	Mercury Nickel Silver	71.3 18.6 9.8	Ingestion Inhalation Dermal	2.2 0.1 97.7
Future Child Resident - surface	7.53E-06	Chromium PCB, Total Total PAH	27.9 17.5 54.3	Ingestion Inhalation Dermal External Exposure	15.6 29.1 55.4	5.29	Mercury Nickel Silver	71.7 18.4 9.6	Ingestion Inhalation Dermal	8.4 0.1 91.5
Future Teen Recreational User - surface	1.36E-06	*no COCs				1.82	Mercury Nickel Silver	71.2 18.6 9.8	Ingestion Inhalation Dermal	0.4 0.0 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.19. Summary of Risk Characterization for SWMU 194, EU 12

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.72E-05	Chromium Total PAH	12.2 87.7	Ingestion Inhalation Dermal External Exposure	6.6 12.4 81.0	<1	Nickel Silver	60.7 36.8	Ingestion Inhalation Dermal	1.0 0.3 98.7
Outdoor Worker - surface	1.99E-05	Chromium Total PAH	7.8 92.2	Ingestion Inhalation Dermal External Exposure	40.5 7.9 51.6	<1	Nickel	60.8	Ingestion Inhalation Dermal	9.1 0.3 90.6
Outdoor Worker - subsurface	3.83E-05	Arsenic Chromium Total PAH	57.8 4.1 38.1	Ingestion Inhalation Dermal External Exposure	61.4 4.1 34.4	<1	Arsenic Nickel Silver	31.1 33.3 25.9	Ingestion Inhalation Dermal	33.5 3.0 63.5

Table D6.19. Summary of Risk Characterization for SWMU 194, EU 12 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.99E-05	Chromium Total PAH	8.2 91.8	Ingestion Inhalation Dermal External Exposure	20.4 8.3 71.3	<1	Nickel Silver	60.7 36.9	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	4.99E-05	Chromium Total PAH	8.2 91.8	Ingestion Inhalation Dermal External Exposure	20.4 8.3 71.3	1.25	Nickel Silver	60.8 36.8	Ingestion Inhalation Dermal	6.5 0.3 93.1
Future Teen Recreational User - surface	1.03E-05	Total PAH	96.3	Ingestion Inhalation Dermal External Exposure	2.0 3.8 94.2	<1	Nickel Silver	60.6 36.9	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.20. Summary of Risk Characterization for SWMU 194, EU 13

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.13E-06	Chromium Total PAH	50.5 49.3	Ingestion Inhalation Dermal External Exposure	3.7 50.8 45.5	<1	Nickel	96.2	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	3.06E-06	Chromium Total PAH	38.2 61.6	Ingestion Inhalation Dermal External Exposure	27.1 38.4 34.5	<1	Nickel	96.4	Ingestion Inhalation Dermal	9.0 0.5 90.6
Outdoor Worker - subsurface	2.68E-05	Arsenic Chromium Total PAH	89.1 5.7 5.2	Ingestion Inhalation Dermal External Exposure	71.1 5.8 23.1	<1	Arsenic Nickel	47.5 40.9	Ingestion Inhalation Dermal	45.2 3.5 51.3

Table D6.20. Summary of Risk Characterization for SWMU 194, EU 13 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.78E-06	Chromium Total PAH	39.4 60.4	Ingestion Inhalation Dermal External Exposure	13.4 39.6 46.9	<1	Nickel	96.2	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	7.78E-06	Chromium Total PAH	39.4 60.4	Ingestion Inhalation Dermal External Exposure	13.4 39.6 46.9	<1	Nickel	96.3	Ingestion Inhalation Dermal	6.5 0.5 93.0
Future Teen Recreational User - surface	1.30E-06	Total PAH	77.8	Ingestion Inhalation Dermal External Exposure	1.6 22.2 76.2	<1	Nickel	96.1	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.21. Summary of Risk Characterization for SWMU 194, EU 14

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.73E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury	99.3	Ingestion Inhalation Dermal	1.5 98.5
Outdoor Worker - surface	1.28E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury	99.4	Ingestion Inhalation Dermal	12.4 87.6
Outdoor Worker - subsurface	2.76E-05	Arsenic Chromium	94.6 5.4	Ingestion Inhalation Dermal External Exposure	73.1 5.5 21.5	1.26	Arsenic Mercury Nickel	12.9 65.5 10.6	Ingestion Inhalation Dermal	25.9 1.2 72.9

Table D6.21. Summary of Risk Characterization for SWMU 194, EU 14 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	65.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.35E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	1.56	Mercury	99.3	Ingestion Inhalation Dermal	2.4 97.6
Future Child Resident - surface	3.35E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	3.84	Mercury	99.4	Ingestion Inhalation Dermal	9.0 91.0
Future Teen Recreational User - surface	<1E-6	*no COCs				1.31	Mercury	99.3	Ingestion Inhalation Dermal	0.4 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.22. Summary of Risk Characterization for SWMU 194, EU 15

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.77E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.31E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.31E-05	Arsenic Chromium	93.5 6.4	Ingestion Inhalation Dermal External Exposure	72.3 6.5 21.2	<1	Arsenic Nickel	32.9 36.8	Ingestion Inhalation Dermal	34.5 2.7 62.8

Table D6.22. Summary of Risk Characterization for SWMU 194, EU 15 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.43E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Silver	93.9	Ingestion Inhalation Dermal	1.6 98.4
Future Child Resident - surface	3.43E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Silver	94.1	Ingestion Inhalation Dermal	6.4 93.6
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Silver	93.8	Ingestion Inhalation Dermal	0.3 99.7

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.23. Summary of Risk Characterization for SWMU 194, EU 16

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.33E-05	Arsenic Chromium	86.7 13.2	Ingestion Inhalation Dermal External Exposure	22.7 13.4 63.9	<1	Nickel	50.6	Ingestion Inhalation Dermal	8.9 0.5 90.6
Outdoor Worker - surface	2.91E-05	Arsenic Chromium	95.5 4.5	Ingestion Inhalation Dermal External Exposure	73.8 4.6 21.7	<1	Arsenic Nickel	39.9 31.3	Ingestion Inhalation Dermal	48.4 0.3 51.3
Outdoor Worker - subsurface	2.77E-05	Arsenic Chromium	95.3 4.7	Ingestion Inhalation Dermal External Exposure	73.6 4.8 21.6	<1	Arsenic Nickel	27.6 27.2	Ingestion Inhalation Dermal	39.9 5.0 55.1

Table D6.23. Summary of Risk Characterization for SWMU 194, EU 16 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.24E-05	Arsenic Chromium	93.4 6.5	Ingestion Inhalation Dermal External Exposure	51.7 6.6 41.7	<1	Arsenic Nickel	24.1 48.2	Ingestion Inhalation Dermal	13.9 0.3 85.8
Future Child Resident - surface	5.24E-05	Arsenic Chromium	93.4 6.5	Ingestion Inhalation Dermal External Exposure	51.7 6.6 41.7	1.95	Antimony Arsenic Nickel Thallium Vanadium	6.9 35.9 35.6 8.8 7.3	Ingestion Inhalation Dermal	39.6 0.4 60.0
Future Teen Recreational User - surface	6.82E-06	Arsenic	95.3	Ingestion Inhalation Dermal External Exposure	8.1 4.8 87.1	<1	Nickel	53.8	Ingestion Inhalation Dermal	2.5 0.2 97.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.24. Summary of Risk Characterization for SWMU 194, EU 17

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.58E-05	Arsenic Chromium Total PAH	73.3 9.7 17.0	Ingestion Inhalation Dermal External Exposure	20.4 9.9 69.7	<1	*no COCs			
Outdoor Worker - surface	3.22E-05	Arsenic Chromium Total PAH	86.3 3.5 10.1	Ingestion Inhalation Dermal External Exposure	71.1 3.6 25.3	<1	Arsenic	94.8	Ingestion Inhalation Dermal	75.1 0.4 24.5
Outdoor Worker - subsurface	3.26E-05	Arsenic Cesium-137 Chromium Total PAH	82.5 6.7 4.1 6.6	Ingestion Inhalation Dermal External Exposure	66.7 4.2 22.4 6.7	<1	Arsenic Nickel	54.5 42.5	Ingestion Inhalation Dermal	46.9 0.4 52.6

Table D6.24. Summary of Risk Characterization for SWMU 194, EU 17 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.02E-05	Arsenic Chromium Total PAH	81.5 5.0 13.6	Ingestion Inhalation Dermal External Exposure	48.1 5.0 46.9	<1	Arsenic	90.9	Ingestion Inhalation Dermal	34.3 0.6 65.1
Future Child Resident - surface	6.02E-05	Arsenic Chromium Total PAH	81.5 5.0 13.6	Ingestion Inhalation Dermal External Exposure	48.1 5.0 46.9	<1	Arsenic	94.1	Ingestion Inhalation Dermal	67.8 0.6 31.6
Future Teen Recreational User - surface	8.56E-06	Arsenic Total PAH	76.1 20.6	Ingestion Inhalation Dermal External Exposure	6.9 3.3 89.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.25. Summary of Risk Characterization for SWMU 194, EU 18

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.29E-05	Arsenic Chromium	82.3 17.6	Ingestion Inhalation Dermal External Exposure	21.5 17.8 60.7	<1	Nickel	59.5	Ingestion Inhalation Dermal	8.3 0.7 91.0
Outdoor Worker - surface	2.72E-05	Arsenic Chromium	93.8 6.2	Ingestion Inhalation Dermal External Exposure	72.5 6.3 21.3	<1	Arsenic Nickel	55.2 37.8	Ingestion Inhalation Dermal	46.5 0.4 53.1
Outdoor Worker - subsurface	3.03E-05	Arsenic Chromium	94.4 5.5	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic Iron Nickel	24.0 21.0 24.9	Ingestion Inhalation Dermal	51.6 2.3 46.1

Table D6.25. Summary of Risk Characterization for SWMU 194, EU 18 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.93E-05	Arsenic Chromium	91.0 8.9	Ingestion Inhalation Dermal External Exposure	50.3 9.0 40.6	<1	Arsenic Nickel	32.5 56.9	Ingestion Inhalation Dermal	13.0 0.4 86.6
Future Child Resident - surface	4.93E-05	Arsenic Chromium	91.0 8.9	Ingestion Inhalation Dermal External Exposure	50.3 9.0 40.6	1.30	Arsenic Nickel	49.3 42.8	Ingestion Inhalation Dermal	37.8 0.5 61.7
Future Teen Recreational User - surface	6.38E-06	Arsenic	93.5	Ingestion Inhalation Dermal External Exposure	7.9 6.6 85.5	<1	Nickel	63.0	Ingestion Inhalation Dermal	2.3 0.2 97.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.26. Summary of Risk Characterization for SWMU 194, EU 19

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.23E-05	Arsenic Chromium	87.0 13.0	Ingestion Inhalation Dermal External Exposure	22.7 13.2 64.1	<1	Nickel	65.1	Ingestion Inhalation Dermal	9.0 0.7 90.3
Outdoor Worker - surface	2.70E-05	Arsenic Chromium	95.6 4.4	Ingestion Inhalation Dermal External Exposure	73.8 4.5 21.7	<1	Arsenic Nickel	58.4 40.0	Ingestion Inhalation Dermal	48.7 0.4 50.9
Outdoor Worker - subsurface	2.52E-05	Arsenic Chromium	95.3 4.7	Ingestion Inhalation Dermal External Exposure	73.6 4.8 21.6	<1	Arsenic Nickel	42.4 36.4	Ingestion Inhalation Dermal	37.9 0.3 61.8

Table D6.26. Summary of Risk Characterization for SWMU 194, EU 19 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.85E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.7 6.5 41.8	<1	Arsenic Nickel	35.4 62.0	Ingestion Inhalation Dermal	14.1 0.4 85.5
Future Child Resident - surface	4.85E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.7 6.5 41.8	1.24	Arsenic Nickel	52.6 45.5	Ingestion Inhalation Dermal	39.9 0.5 59.6
Future Teen Recreational User - surface	6.32E-06	Arsenic	95.4	Ingestion Inhalation Dermal External Exposure	8.1 4.7 87.2	<1	Nickel	69.3	Ingestion Inhalation Dermal	2.5 0.2 97.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.27. Summary of Risk Characterization for SWMU 194, EU 20

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.42E-05	Arsenic Chromium	83.5 12.2	Ingestion Inhalation Dermal External Exposure	22.1 12.9 65.0	1.54	Cobalt Mercury Nickel Silver	13.0 52.6 10.0 7.4	Ingestion Inhalation Dermal	5.3 3.7 91.0
Outdoor Worker - surface	3.05E-05	Arsenic Chromium	93.5 4.2	Ingestion Inhalation Dermal External Exposure	73.2 4.5 22.4	1.66	Arsenic Cobalt Manganese Mercury Nickel	10.8 22.2 7.0 40.7 7.5	Ingestion Inhalation Dermal	34.8 2.5 62.6
Outdoor Worker - subsurface	2.98E-05	Arsenic Chromium	92.6 5.9	Ingestion Inhalation Dermal External Exposure	72.1 6.1 21.8	1.51	Arsenic Cobalt Manganese Mercury Nickel	11.4 17.1 7.8 44.6 8.2	Ingestion Inhalation Dermal	32.7 2.8 64.6

Table D6.27. Summary of Risk Characterization for SWMU 194, EU 20 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	44.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.54E-05	Arsenic Chromium Total PAH	90.8 6.1 2.9	Ingestion Inhalation Dermal External Exposure	50.8 6.4 42.7	2.66	Arsenic Cobalt Manganese Mercury Nickel Silver	5.5 14.1 4.5 52.1 9.8 7.3	Ingestion Inhalation Dermal	8.6 2.0 89.4
Future Child Resident - surface	5.54E-05	Arsenic Chromium Total PAH	90.8 6.1 2.9	Ingestion Inhalation Dermal External Exposure	50.8 6.4 42.7	7.82	Arsenic Barium Beryllium Cobalt Manganese Mercury Nickel Silver Vanadium	9.2 3.0 1.4 19.8 7.0 43.6 8.1 6.0 1.7	Ingestion Inhalation Dermal	27.1 3.2 69.7
Future Teen Recreational User - surface	7.36E-06	Arsenic	90.8	Ingestion Inhalation Dermal External Exposure	7.8 4.6 87.7	2.09	Cobalt Mercury Nickel Silver	11.9 55.7 10.6 7.8	Ingestion Inhalation Dermal	1.5 1.0 97.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.28. Summary of Risk Characterization for SWMU 194, EU 21

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.83E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury Nickel	76.2 17.0	Ingestion Inhalation Dermal	1.8 0.1 98.1
Outdoor Worker - surface	1.36E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury Nickel	74.2 16.0	Ingestion Inhalation Dermal	15.1 0.1 84.8
Outdoor Worker - subsurface	8.64E-05	Arsenic Chromium	98.2 1.6	Ingestion Inhalation Dermal External Exposure	75.8 1.9 22.3	5.31	Arsenic Barium Cobalt Iron Manganese Mercury Nickel	10.0 7.8 27.2 6.6 29.8 11.6 2.5	Ingestion Inhalation Dermal	49.9 9.9 40.1

Table D6.28. Summary of Risk Characterization for SWMU 194, EU 21 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.08E-06	Arsenic	98.2	See Outdoor Worker (subsurface)		1.66	Arsenic Barium Cobalt Iron Manganese Mercury	10.0 7.8 27.2 6.6 29.8 11.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.56E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	1.66	Mercury Nickel	76.1 16.9	Ingestion Inhalation Dermal	3.0 0.0 97.0
Future Child Resident - surface	3.56E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	4.15	Antimony Mercury Nickel Thallium	4.1 74.8 16.3 4.2	Ingestion Inhalation Dermal	11.1 0.1 88.8
Future Teen Recreational User - surface	<1E-6	*no COCs				1.38	Mercury Nickel	76.5 17.0	Ingestion Inhalation Dermal	0.5 0.0 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.29. Summary of Risk Characterization for SWMU 194, EU 22

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.35E-06	PCB, Total	97.3	Ingestion Inhalation Dermal External Exposure	6.4 9.7 84.0	<1	*no COCs			
Future Industrial Worker - surface	5.98E-05	Chromium PCB, Total	2.7 97.3	Ingestion Inhalation Dermal External Exposure	6.4 9.7 84.0	<1	*no COCs			
Outdoor Worker - surface	6.85E-05	Chromium PCB, Total	1.8 98.2	Ingestion Inhalation Dermal External Exposure	39.6 6.2 54.2	<1	*no COCs			
Outdoor Worker - subsurface	9.45E-05	Arsenic Cesium-137 Chromium PCB, Total	29.3 1.5 1.2 67.9	Ingestion Inhalation Dermal External Exposure	50.0 4.4 44.1 1.5	<1	Arsenic Cobalt Nickel	24.1 26.1 18.6	Ingestion Inhalation Dermal	48.6 3.1 48.3

Table D6.29. Summary of Risk Characterization for SWMU 194, EU 22 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.18E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.74E-04	Chromium PCB, Total	1.8 98.2	Ingestion Inhalation Dermal External Exposure	19.6 6.5 73.9	<1	*no COCs			
Future Child Resident - surface	1.74E-04	Chromium PCB, Total	1.8 98.2	Ingestion Inhalation Dermal External Exposure	19.6 6.5 73.9	<1	Manganese	89.5	Ingestion Inhalation Dermal	34.5 36.1 29.5
Future Teen Recreational User - surface	3.68E-05	PCB, Total	99.2	Ingestion Inhalation Dermal External Exposure	1.9 2.9 95.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.30. Summary of Risk Characterization for SWMU 194, EU 23

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.38E-05	Arsenic Chromium	84.1 15.9	Ingestion Inhalation Dermal External Exposure	22.0 16.1 62.0	<1	Nickel Silver	44.1 22.9	Ingestion Inhalation Dermal	7.5 0.4 92.1
Outdoor Worker - surface	2.95E-05	Arsenic Chromium	94.5 5.5	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic Iron Nickel	30.7 23.9 29.2	Ingestion Inhalation Dermal	43.8 0.3 56.0
Outdoor Worker - subsurface	3.10E-05	Arsenic Cesium-137 Chromium	87.4 7.9 4.7	Ingestion Inhalation Dermal External Exposure	67.6 4.7 19.8 7.8	1.32	Arsenic Iron Mercury Nickel	12.8 10.8 54.4 10.5	Ingestion Inhalation Dermal	28.6 1.0 70.4

Table D6.30. Summary of Risk Characterization for SWMU 194, EU 23 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	54.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.33E-05	Arsenic Chromium	92.0 8.0	Ingestion Inhalation Dermal External Exposure	50.9 8.1 41.1	<1	Arsenic Iron Nickel Silver	17.4 16.7 42.3 22.1	Ingestion Inhalation Dermal	11.8 0.2 88.0
Future Child Resident - surface	5.33E-05	Arsenic Chromium	92.0 8.0	Ingestion Inhalation Dermal External Exposure	50.9 8.1 41.1	2.59	Arsenic Iron Nickel Silver	27.2 21.9 32.7 17.0	Ingestion Inhalation Dermal	35.3 0.3 64.4
Future Teen Recreational User - surface	6.92E-06	Arsenic	94.2	Ingestion Inhalation Dermal External Exposure	8.0 5.8 86.2	<1	Nickel Silver	46.2 24.2	Ingestion Inhalation Dermal	2.1 0.1 97.8

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.31. Summary of Risk Characterization for SWMU 194, EU 24

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.06E-06	Chromium	80.9	Ingestion Inhalation Dermal External Exposure	1.4 81.3 17.3	<1	Nickel	96.5	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.71E-06	Chromium	72.1	Ingestion Inhalation Dermal External Exposure	12.1 72.5 15.4	<1	Nickel	96.7	Ingestion Inhalation Dermal	9.0 0.5 90.5
Outdoor Worker - subsurface	3.20E-05	Arsenic Cesium-137 Chromium	89.7 5.8 3.6	Ingestion Inhalation Dermal External Exposure	69.8 3.6 20.9 5.7	1.21	Arsenic Iron Mercury Nickel	14.9 14.2 54.0 13.1	Ingestion Inhalation Dermal	30.2 0.9 68.8

Table D6.31. Summary of Risk Characterization for SWMU 194, EU 24 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	54.0	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.42E-06	Chromium Total PAH	73.1 26.6	Ingestion Inhalation Dermal External Exposure	5.9 73.5 20.6	<1	Nickel	96.5	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	4.42E-06	Chromium Total PAH	73.1 26.6	Ingestion Inhalation Dermal External Exposure	5.9 73.5 20.6	<1	Nickel	96.7	Ingestion Inhalation Dermal	6.5 0.5 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	96.5	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.32. Summary of Risk Characterization for SWMU 194, EU 25

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.38E-06	Chromium	85.1	Ingestion Inhalation Dermal External Exposure	1.1 85.4 13.5	<1	Nickel	60.5	Ingestion Inhalation Dermal	2.4 9.6 88.1
Outdoor Worker - surface	1.93E-06	Chromium	77.8	Ingestion Inhalation Dermal External Exposure	9.7 78.0 12.3	<1	Nickel	54.8	Ingestion Inhalation Dermal	18.9 8.0 73.2
Outdoor Worker - subsurface	2.70E-05	Arsenic Chromium	93.7 4.7	Ingestion Inhalation Dermal External Exposure	73.1 4.8 22.1	<1	Arsenic Nickel	33.8 25.5	Ingestion Inhalation Dermal	45.9 4.3 49.8

Table D6.32. Summary of Risk Characterization for SWMU 194, EU 25 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.01E-06	Chromium Total PAH	78.6 21.1	Ingestion Inhalation Dermal External Exposure	4.7 78.9 16.4	<1	Nickel	62.5	Ingestion Inhalation Dermal	4.0 5.4 90.6
Future Child Resident - surface	5.01E-06	Chromium Total PAH	78.6 21.1	Ingestion Inhalation Dermal External Exposure	4.7 78.9 16.4	1.09	Barium Manganese Nickel	19.6 21.8 56.0	Ingestion Inhalation Dermal	13.9 9.3 76.8
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	65.6	Ingestion Inhalation Dermal	0.7 2.7 96.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.33. Summary of Risk Characterization for SWMU 194, EU 26

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.39E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - surface	1.03E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - subsurface	2.31E-05	Arsenic Chromium	94.7 5.1	Ingestion Inhalation Dermal External Exposure	73.2 5.3 21.5 	<1	Arsenic Cobalt	22.2 38.0	Ingestion Inhalation Dermal	59.7 2.4 38.0

Table D6.33. Summary of Risk Characterization for SWMU 194, EU 26 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.69E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Silver	72.5	Ingestion Inhalation Dermal	4.4 0.0 95.5
Future Child Resident - surface	2.69E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Silver Thallium	67.1 18.1	Ingestion Inhalation Dermal	15.9 0.0 84.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Silver	74.2	Ingestion Inhalation Dermal	0.7 0.0 99.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.34. Summary of Risk Characterization for SWMU 194, EU 27

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.74E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	60.4	Ingestion Inhalation Dermal	1.0 0.3 98.7
Outdoor Worker - surface	1.28E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	60.5	Ingestion Inhalation Dermal	9.1 0.3 90.6
Outdoor Worker - subsurface	2.69E-05	Arsenic Chromium	95.3 4.7	Ingestion Inhalation Dermal External Exposure	73.6 4.8 21.6	<1	Arsenic Nickel	41.7 32.2	Ingestion Inhalation Dermal	38.1 0.3 61.6

Table D6.34. Summary of Risk Characterization for SWMU 194, EU 27 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.37E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	60.4 37.2	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	3.37E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	1.04	Nickel Silver	60.5 37.2	Ingestion Inhalation Dermal	6.5 0.3 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	60.3 37.2	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.35. Summary of Risk Characterization for SWMU 194, EU 28

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.41E-05	Arsenic Chromium	85.7 14.3	Ingestion Inhalation Dermal External Exposure	22.4 14.5 63.1	<1	Nickel Silver	38.6 23.9	Ingestion Inhalation Dermal	7.3 6.4 86.3
Outdoor Worker - surface	3.05E-05	Arsenic Chromium	95.1 4.9	Ingestion Inhalation Dermal External Exposure	73.5 5.0 21.6	<1	Arsenic Nickel	35.8 25.9	Ingestion Inhalation Dermal	42.9 3.9 53.1
Outdoor Worker - subsurface	2.88E-05	Arsenic Chromium	94.6 5.4	Ingestion Inhalation Dermal External Exposure	73.0 5.5 21.5	<1	Arsenic Nickel Silver	32.1 24.6 21.6	Ingestion Inhalation Dermal	40.0 4.0 56.0

Table D6.35. Summary of Risk Characterization for SWMU 194, EU 28 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.50E-05	Arsenic Chromium	92.9 7.1	Ingestion Inhalation Dermal External Exposure	51.4 7.2 41.4	<1	Arsenic Nickel Silver	20.6 38.1 23.6	Ingestion Inhalation Dermal	11.8 3.5 84.8
Future Child Resident - surface	5.50E-05	Arsenic Chromium	92.9 7.1	Ingestion Inhalation Dermal External Exposure	51.4 7.2 41.4	2.33	Arsenic Manganese Nickel Silver Vanadium	31.5 11.7 28.8 17.8 6.1	Ingestion Inhalation Dermal	34.3 5.0 60.7
Future Teen Recreational User - surface	7.16E-06	Arsenic	94.9	Ingestion Inhalation Dermal External Exposure	8.0 5.2 86.8	<1	Nickel Silver	42.5 26.4	Ingestion Inhalation Dermal	2.1 1.9 96.0

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.36. Summary of Risk Characterization for SWMU 194, EU 29

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.68E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	54.9	Ingestion Inhalation Dermal	1.2 0.3 98.5
Outdoor Worker - surface	1.24E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	54.1	Ingestion Inhalation Dermal	10.8 0.3 89.0
Outdoor Worker - subsurface	3.59E-05	Arsenic Chromium	95.9 3.9	Ingestion Inhalation Dermal External Exposure	74.1 4.1 21.8	1.04	Arsenic Cobalt Manganese Nickel	20.7 23.7 13.0 15.4	Ingestion Inhalation Dermal	50.3 4.8 45.0

Table D6.36. Summary of Risk Characterization for SWMU 194, EU 29 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.26E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	54.8 32.8	Ingestion Inhalation Dermal	2.0 0.2 97.8
Future Child Resident - surface	3.26E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	1.15	Antimony Nickel Silver	11.1 54.4 32.5	Ingestion Inhalation Dermal	7.8 0.3 91.9
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	54.9 32.9	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.37. Summary of Risk Characterization for SWMU 194, EU 30

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.88E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	1.24	Mercury Nickel	79.0 13.2	Ingestion Inhalation Dermal	1.4 0.1 98.6
Outdoor Worker - surface	1.39E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	1.02	Mercury Nickel	79.5 12.8	Ingestion Inhalation Dermal	11.8 0.1 88.1
Outdoor Worker - subsurface	2.42E-05	Arsenic Chromium	94.2 5.8	Ingestion Inhalation Dermal External Exposure	72.8 5.9 21.4	1.29	Arsenic Mercury Nickel	11.0 63.3 10.2	Ingestion Inhalation Dermal	21.1 0.9 78.1

Table D6.37. Summary of Risk Characterization for SWMU 194, EU 30 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	63.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.65E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	2.12	Mercury Nickel Silver	79.0 13.1 7.3	Ingestion Inhalation Dermal	2.2 0.0 97.7
Future Child Resident - surface	3.65E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	5.20	Mercury Nickel Silver	79.3 13.0 7.2	Ingestion Inhalation Dermal	8.6 0.1 91.4
Future Teen Recreational User - surface	<1E-6	*no COCs				1.78	Mercury Nickel Silver	78.9 13.2 7.3	Ingestion Inhalation Dermal	0.4 0.0 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.38. Summary of Risk Characterization for SWMU 194, EU 31

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs					*no COCs			
Future Industrial Worker - surface	7.63E-06	Cesium-137 Uranium-238	86.7 13.3	Ingestion Inhalation Dermal External Exposure	1.6 0.0 98.4		*no COCs			
Outdoor Worker - surface	6.41E-06	Cesium-137 Uranium-238	77.1 22.9	Ingestion Inhalation Dermal External Exposure	13.4 0.0 86.6		*no COCs			
Outdoor Worker - subsurface	6.41E-06	Cesium-137 Uranium-238	77.1 22.9	Ingestion Inhalation Dermal External Exposure	13.4 0.0 86.6		*no COCs			

Table D6.38. Summary of Risk Characterization for SWMU 194, EU 31 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.83E-05	Cesium-137 Uranium-238	87.0 13.0	Ingestion Inhalation Dermal External Exposure	1.3 0.0 98.7		*no COCs			
Future Child Resident - surface	3.83E-05	Cesium-137 Uranium-238	87.0 13.0	Ingestion Inhalation Dermal External Exposure	1.3 0.0 98.7		*no COCs			
Future Teen Recreational User - surface	1.59E-06	Cesium-137	87.4	Ingestion Inhalation Dermal External Exposure	0.8 0.0 99.1		*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.39. Summary of Risk Characterization for SWMU 196, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.76E-06	Neptunium-237	41.6	Ingestion Inhalation Dermal External Exposure	4.2 25.8 70.0	1.35	Nickel	96.5	Ingestion Inhalation Dermal	1.3 0.5 98.1
Outdoor Worker - surface	2.79E-06	Uranium-238	47.2	Ingestion Inhalation Dermal External Exposure	29.8 18.9 51.3	1.11	Nickel	94.3	Ingestion Inhalation Dermal	11.6 0.5 88.0
Outdoor Worker - subsurface	3.08E-05	Arsenic Chromium Uranium-238	82.2 8.9 4.3	Ingestion Inhalation Dermal External Exposure	66.2 10.5 18.6 4.6	18.84	Antimony Arsenic Beryllium Cadmium Cobalt Iron Manganese Nickel Silver Thallium	23.8 0.8 11.3 3.0 10.3 1.2 0.5 5.9 2.6 39.1	Ingestion Inhalation Dermal	45.2 0.4 54.5

Table D6.39. Summary of Risk Characterization for SWMU 196, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		5.89	Antimony Beryllium Cadmium Cobalt Nickel Silver Thallium	23.8 11.3 3.0 10.3 5.9 2.6 39.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.16E-05	Chromium Neptunium-237 Uranium-238	10.9 49.7 38.4	Ingestion Inhalation Dermal External Exposure	4.1 11.9 84.1	2.30	Nickel	96.3	Ingestion Inhalation Dermal	2.2 0.3 97.5
Future Child Resident - surface	1.16E-05	Chromium Neptunium-237 Uranium-238	10.9 49.7 38.4	Ingestion Inhalation Dermal External Exposure	4.1 11.9 84.1	5.65	Antimony Nickel Uranium	1.9 94.9 3.0	Ingestion Inhalation Dermal	8.4 0.5 91.1
Future Teen Recreational User - surface	<1E-6	*no COCs				1.93	Nickel	96.7	Ingestion Inhalation Dermal	0.4 0.1 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.40. Summary of Risk Characterization for SWMU 196, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.21E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.15E-05	PCB, Total Total PAH Uranium-238	37.4 53.4 6.0	Ingestion Inhalation Dermal External Exposure	7.2 6.0 81.5 5.3	<1	Nickel	80.1	Ingestion Inhalation Dermal	1.6 0.8 97.6
Outdoor Worker - surface	2.57E-05	PCB, Total Total PAH Uranium-238	36.2 54.5 7.3	Ingestion Inhalation Dermal External Exposure	42.5 3.7 50.5 3.3	<1	Nickel	76.5	Ingestion Inhalation Dermal	13.9 0.7 85.5
Outdoor Worker - subsurface	2.20E-04	Arsenic PCB, Total Total PAH Uranium-238	10.3 4.2 84.6 0.9	Ingestion Inhalation Dermal External Exposure	47.3 0.3 52.0 0.4	2.80	Antimony Arsenic Nickel	82.2 5.0 5.4	Ingestion Inhalation Dermal	28.0 0.2 71.8

Table D6.40. Summary of Risk Characterization for SWMU 196, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.75E-06	Total PAH	84.6	See Outdoor Worker (subsurface)		<1	Antimony	82.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.64E-05	Chromium PCB, Total Total PAH Uranium-238	2.0 35.6 52.7 9.6	Ingestion Inhalation Dermal External Exposure	19.7 3.8 67.8 8.7	<1	Nickel	79.9	Ingestion Inhalation Dermal	2.7 0.4 96.9
Future Child Resident - surface	6.64E-05	Chromium PCB, Total Total PAH Uranium-238	2.0 35.6 52.7 9.6	Ingestion Inhalation Dermal External Exposure	19.7 3.8 67.8 8.7	<1	Barium Nickel	15.7 77.6	Ingestion Inhalation Dermal	10.1 0.8 89.1
Future Teen Recreational User - surface	1.30E-05	PCB, Total Total PAH	38.9 58.2	Ingestion Inhalation Dermal External Exposure	2.1 1.8 94.2 1.9	<1	Nickel	80.6	Ingestion Inhalation Dermal	0.4 0.2 99.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.41. Summary of Risk Characterization for SWMU 489

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.64E-06	Chromium Total PAH	37.9 38.1	Ingestion Inhalation Dermal External Exposure	5.5 38.3 35.2 21.0	<1	Nickel	97.4	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	3.97E-06	Chromium Total PAH Uranium-238	25.7 42.6 31.5	Ingestion Inhalation Dermal External Exposure	36.0 25.9 23.8 14.2	<1	Nickel	97.6	Ingestion Inhalation Dermal	9.1 0.5 90.5
Outdoor Worker - subsurface	2.71E-05	Arsenic Total PAH Uranium-238	89.1 6.3 4.6	Ingestion Inhalation Dermal External Exposure	74.1 0.1 23.7 2.1	<1	Arsenic Nickel	49.6 49.0	Ingestion Inhalation Dermal	43.7 0.4 55.8

Table D6.41. Summary of Risk Characterization for SWMU 489 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.12E-05	Chromium Total PAH Uranium-238	24.0 37.9 38.0	Ingestion Inhalation Dermal External Exposure	11.9 24.2 29.4 34.5	<1	Nickel	97.4	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	1.12E-05	Chromium Total PAH Uranium-238	24.0 37.9 38.0	Ingestion Inhalation Dermal External Exposure	11.9 24.2 29.4 34.5	<1	Nickel	97.5	Ingestion Inhalation Dermal	6.5 0.5 92.9
Future Teen Recreational User - surface	1.34E-06	*no COCs				<1	Nickel	97.4	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.42. Summary of Risk Characterization for SWMU 531

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.91E-06	Arsenic	90.4	Ingestion Inhalation Dermal External Exposure	24.2 3.4 68.2 4.1	<1	*no COCs			
Future Industrial Worker - surface	5.19E-05	Arsenic Chromium Uranium-238	90.4 3.2 3.9	Ingestion Inhalation Dermal External Exposure	24.2 3.4 68.2 4.1	<1	Arsenic Iron Nickel	29.5 22.7 37.9	Ingestion Inhalation Dermal	13.1 0.6 86.3
Outdoor Worker - surface	1.18E-04	Arsenic Chromium Total PAH Uranium-238	95.3 1.0 0.9 2.5	Ingestion Inhalation Dermal External Exposure	75.4 1.1 22.1 1.3	1.57	Arsenic Iron Nickel	44.8 26.8 19.5	Ingestion Inhalation Dermal	59.1 0.3 40.6
Outdoor Worker - subsurface	1.19E-04	Arsenic Chromium Total PAH Uranium-238	95.2 1.1 0.9 2.5	Ingestion Inhalation Dermal External Exposure	75.4 1.2 22.1 1.3	1.62	Arsenic Iron Nickel	43.6 26.0 18.9	Ingestion Inhalation Dermal	58.8 1.1 40.0

Table D6.42. Summary of Risk Characterization for SWMU 531 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.48E-06	Arsenic	95.2	See Outdoor Worker (subsurface)		<1	Arsenic Iron	43.6 26.0	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.17E-04	Arsenic Chromium Total PAH Uranium-235 Uranium-238	91.8 1.5 1.3 0.8 4.6	Ingestion Inhalation Dermal External Exposure	51.5 1.6 41.9 5.0	1.84	Arsenic Iron Nickel	31.7 23.3 35.2	Ingestion Inhalation Dermal	19.9 0.3 79.8
Future Child Resident - surface	2.17E-04	Arsenic Chromium Total PAH Uranium-235 Uranium-238	91.8 1.5 1.3 0.8 4.6	Ingestion Inhalation Dermal External Exposure	51.5 1.6 41.9 5.0	6.80	Antimony Arsenic Iron Nickel Uranium Zinc	2.7 41.9 26.0 23.0 2.6 2.6	Ingestion Inhalation Dermal	50.3 0.4 49.4
Future Teen Recreational User - surface	2.78E-05	Arsenic	95.0	Ingestion Inhalation Dermal External Exposure	8.2 1.2 89.0 1.6	1.31	Arsenic Iron Nickel	26.3 21.9 41.7	Ingestion Inhalation Dermal	3.8 0.2 96.0

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.43. Summary of Risk Characterization for SWMU 200

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.42E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.54E-05	Cesium-137 Chromium PCB, Total Uranium-238	26.3 7.5 54.6 8.3	Ingestion Inhalation Dermal External Exposure	4.7 11.5 48.8 35.0	1.10	Mercury Nickel	67.8 27.2	Ingestion Inhalation Dermal	1.7 0.2 98.1
Outdoor Worker - surface	2.64E-05	Cesium-137 Chromium PCB, Total Uranium-238	18.9 5.3 60.8 11.6	Ingestion Inhalation Dermal External Exposure	32.2 8.2 34.8 24.9	<1	Mercury Nickel	66.4 25.8	Ingestion Inhalation Dermal	14.6 0.1 85.3
Outdoor Worker - subsurface	4.81E-05	Arsenic Cesium-137 Chromium PCB, Total Uranium-238	48.8 8.4 3.2 33.3 5.0	Ingestion Inhalation Dermal External Exposure	54.3 4.7 29.9 11.0	1.18	Arsenic Mercury Nickel	12.4 54.2 20.0	Ingestion Inhalation Dermal	22.5 0.8 76.7

Table D6.43. Summary of Risk Characterization for SWMU 200 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	54.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.17E-05	Cesium-137 Chromium PCB, Total Total PAH Uranium-235 Uranium-238	36.6 4.0 44.4 1.6 2.0 11.3	Ingestion Inhalation Dermal External Exposure	10.3 6.2 34.7 48.8	1.89	Mercury Nickel	67.8 27.0	Ingestion Inhalation Dermal	2.9 0.1 97.1
Future Child Resident - surface	9.17E-05	Cesium-137 Chromium PCB, Total Total PAH Uranium-235 Uranium-238	36.6 4.0 44.4 1.6 2.0 11.3	Ingestion Inhalation Dermal External Exposure	10.3 6.2 34.7 48.8	4.71	Antimony Mercury Nickel Uranium	2.2 66.8 26.2 4.2	Ingestion Inhalation Dermal	10.7 0.2 89.2
Future Teen Recreational User - surface	1.13E-05	Cesium-137 PCB, Total	12.4 77.3	Ingestion Inhalation Dermal External Exposure	1.8 4.7 76.9 16.6	1.58	Mercury Nickel	68.1 27.3	Ingestion Inhalation Dermal	0.5 0.0 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.44. Summary of Risk Characterization for SWMU 212

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.40E-06	Thorium-230	31.1	Ingestion Inhalation Dermal External Exposure	35.0 4.7 18.9 41.4	<1	*no COCs			
Future Industrial Worker - surface	6.07E-05	Arsenic Cesium-137 Chromium Neptunium-237 Thorium-230 Uranium-238	23.8 11.5 2.0 24.3 31.1 3.1	Ingestion Inhalation Dermal External Exposure	35.0 4.7 18.9 41.4	<1	Iron Nickel	32.8 40.3	Ingestion Inhalation Dermal	11.6 0.4 87.9
Outdoor Worker - surface	1.80E-04	Arsenic Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-238	19.3 2.9 6.8 0.6 2.3 65.7 1.5	Ingestion Inhalation Dermal External Exposure	83.8 1.2 4.7 10.3	<1	Arsenic Iron Nickel	29.1 41.1 22.0	Ingestion Inhalation Dermal	55.8 0.2 44.0
Outdoor Worker - subsurface	1.81E-04	Arsenic Cesium-137 Chromium Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-238	19.2 2.9 0.9 6.7 0.6 2.3 65.4 1.5	Ingestion Inhalation Dermal External Exposure	83.4 1.6 4.7 10.3	2.01	Arsenic Cobalt Iron Mercury Nickel Silver	10.8 15.2 15.2 31.9 8.1 5.8	Ingestion Inhalation Dermal	39.7 1.4 58.9

Table D6.44. Summary of Risk Characterization for SWMU 212 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.26E-06	Thorium-230	65.4	See Outdoor Worker (subsurface)		<1	Mercury	31.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.65E-04	Arsenic	23.1	Ingestion	39.5	<1	Arsenic	19.6	Ingestion	17.9
		Cesium-137	13.3	Inhalation	1.6		Iron	34.0	Inhalation	0.2
		Chromium	0.9	Dermal	11.1		Nickel	37.7	Dermal	81.9
		Cobalt-60	0.9	External Exposure	47.8					
		Neptunium-237	28.0							
		PCB, Total	1.1							
		Plutonium-239/240	0.9							
		Thorium-230	27.4							
		Uranium-235	1.0							
		Uranium-238	3.5							
Future Child Resident - surface	2.65E-04	Arsenic	23.1	Ingestion	39.5	3.26	Arsenic	26.9	Ingestion	46.9
		Cesium-137	13.3	Inhalation	1.6		Iron	39.4	Inhalation	0.3
		Chromium	0.9	Dermal	11.1		Nickel	25.7	Dermal	52.8
		Cobalt-60	0.9	External Exposure	47.8		Uranium	5.1		
		Neptunium-237	28.0							
		PCB, Total	1.1							
		Plutonium-239/240	0.9							
		Thorium-230	27.4							
		Uranium-235	1.0							
		Uranium-238	3.5							
Future Teen Recreational User - surface	1.64E-05	Arsenic	49.7	Ingestion	16.2	<1	Arsenic	15.9	Ingestion	3.3
		Cesium-137	9.0	Inhalation	2.5		Iron	31.3	Inhalation	0.1
		Neptunium-237	18.8	Dermal	49.0		Nickel	43.8	Dermal	96.5
		Thorium-230	13.5	External Exposure	32.3					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.45. Summary of Risk Characterization for SWMU 213, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	6.25E-06	Chromium Total PAH Uranium-238	25.3 46.4 21.9	Ingestion Inhalation Dermal External Exposure	6.4 26.0 48.2 19.4	<1	Nickel Silver	49.1 38.5	Ingestion Inhalation Dermal	1.3 0.3 98.5
Outdoor Worker - surface	7.16E-06	Chromium Total PAH Uranium-238	16.4 49.5 27.8	Ingestion Inhalation Dermal External Exposure	39.5 16.8 31.2 12.5	<1	Nickel	48.3	Ingestion Inhalation Dermal	10.9 0.2 88.9
Outdoor Worker - subsurface	2.95E-05	Arsenic Chromium Total PAH Uranium-238	75.2 4.5 12.0 6.7	Ingestion Inhalation Dermal External Exposure	67.7 4.7 24.6 3.0	<1	Arsenic Nickel	31.1 28.2	Ingestion Inhalation Dermal	35.3 3.6 61.1

Table D6.45. Summary of Risk Characterization for SWMU 213, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.98E-05	Chromium PCB, Total Total PAH Uranium-238	15.5 5.8 44.6 34.0	Ingestion Inhalation Dermal External Exposure	14.2 15.9 39.0 30.9	<1	Nickel Silver	49.0 38.5	Ingestion Inhalation Dermal	2.1 0.1 97.8
Future Child Resident - surface	1.98E-05	Chromium PCB, Total Total PAH Uranium-238	15.5 5.8 44.6 34.0	Ingestion Inhalation Dermal External Exposure	14.2 15.9 39.0 30.9	1.32	Antimony Nickel Silver	11.6 48.6 38.1	Ingestion Inhalation Dermal	7.8 0.3 91.9
Future Teen Recreational User - surface	2.72E-06	Total PAH	70.3	Ingestion Inhalation Dermal External Exposure	2.3 10.9 77.4 9.4	<1	Nickel Silver	49.1 38.7	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.46. Summary of Risk Characterization for SWMU 213, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.49E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	65.9 32.5	Ingestion Inhalation Dermal	1.0 0.3 98.6
Outdoor Worker - surface	1.11E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	66.0	Ingestion Inhalation Dermal	9.1 0.3 90.5
Outdoor Worker - subsurface	1.67E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Manganese Nickel	29.0 46.5	Ingestion Inhalation Dermal	20.6 9.5 69.9

Table D6.46. Summary of Risk Characterization for SWMU 213, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.90E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	65.9 32.5	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	2.90E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	1.33	Nickel Silver	66.0 32.5	Ingestion Inhalation Dermal	6.6 0.4 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	65.8 32.5	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.47. Summary of Risk Characterization for SWMU 214

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.78E-05	Arsenic	100.0	Ingestion Inhalation Dermal External Exposure	77.3 0.1 22.7	<1	Arsenic	89.1	Ingestion Inhalation Dermal	71.2 0.3 28.5

Table D6.47. Summary of Risk Characterization for SWMU 214 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	<1E-6	*no COCs				<1	*no COCs			
Future Child Resident - surface	<1E-6	*no COCs				<1	Antimony	100.0	Ingestion Inhalation Dermal	17.6 82.4
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.48. Summary of Risk Characterization for SWMU 215

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.27E-06	Chromium Total PAH	58.0 41.7	Ingestion Inhalation Dermal External Exposure	3.2 58.3 38.5	<1	Iron Nickel	43.0 47.6	Ingestion Inhalation Dermal	8.3 0.3 91.5
Outdoor Worker - surface	3.08E-06	Chromium Total PAH	45.7 54.2	Ingestion Inhalation Dermal External Exposure	23.8 45.9 30.3	<1	Iron Nickel	63.0 30.3	Ingestion Inhalation Dermal	46.4 0.1 53.4
Outdoor Worker - subsurface	3.62E-05	Arsenic Chromium Total PAH	67.6 3.9 28.5	Ingestion Inhalation Dermal External Exposure	64.8 4.0 31.3	<1	Arsenic Iron Nickel	22.5 42.2 20.3	Ingestion Inhalation Dermal	49.4 0.2 50.4

Table D6.48. Summary of Risk Characterization for SWMU 215 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.86E-06	Chromium Total PAH	46.9 52.9	Ingestion Inhalation Dermal External Exposure	11.8 47.1 41.1	<1	Iron Nickel	45.5 45.5	Ingestion Inhalation Dermal	13.0 0.1 86.9
Future Child Resident - surface	7.86E-06	Chromium Total PAH	46.9 52.9	Ingestion Inhalation Dermal External Exposure	11.8 47.1 41.1	2.06	Antimony Iron Nickel	6.0 58.4 34.3	Ingestion Inhalation Dermal	37.7 0.2 62.1
Future Teen Recreational User - surface	1.25E-06	*no COCs				<1	Iron Nickel	39.9 50.3	Ingestion Inhalation Dermal	2.3 0.1 97.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.49. Summary of Risk Characterization for SWMU 216

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.09E-06	Total PAH	61.6	Ingestion Inhalation Dermal External Exposure	6.8 19.4 56.9 16.9	<1	*no COCs			
Outdoor Worker - surface	4.80E-06	Total PAH Uranium-238	64.2 23.6	Ingestion Inhalation Dermal External Exposure	41.1 12.3 35.9 10.7	<1	*no COCs			
Outdoor Worker - subsurface	2.85E-05	Arsenic Cesium-137 Total PAH Uranium-238	72.7 12.5 10.8 4.0	Ingestion Inhalation Dermal External Exposure	63.3 0.1 22.5 14.1	<1	Arsenic	100.0	Ingestion Inhalation Dermal	77.0 0.4 22.6

Table D6.49. Summary of Risk Characterization for SWMU 216 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.31E-05	Chromium Total PAH Uranium-238	11.7 58.8 29.4	Ingestion Inhalation Dermal External Exposure	15.8 11.8 45.7 26.7	<1	*no COCs			
Future Child Resident - surface	1.31E-05	Chromium Total PAH Uranium-238	11.7 58.8 29.4	Ingestion Inhalation Dermal External Exposure	15.8 11.8 45.7 26.7	<1	*no COCs			
Future Teen Recreational User - surface	1.96E-06	Total PAH	84.7	Ingestion Inhalation Dermal External Exposure	2.3 7.4 82.9 7.4	<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.50. Summary of Risk Characterization for SWMU 217, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.60E-06	Chromium	79.0	Ingestion Inhalation Dermal External Exposure	2.1 81.2 16.7	<1	Cobalt Nickel Silver	33.7 36.3 22.7	Ingestion Inhalation Dermal	6.9 3.9 89.1
Outdoor Worker - surface	3.15E-06	Chromium	66.9	Ingestion Inhalation Dermal External Exposure	17.1 68.8 14.1	<1	Cobalt Nickel Silver	52.4 24.8 15.5	Ingestion Inhalation Dermal	41.6 2.5 55.9
Outdoor Worker - subsurface	2.53E-05	Arsenic Chromium	89.8 6.3	Ingestion Inhalation Dermal External Exposure	71.4 6.6 20.4 1.7	1.46	Arsenic Cobalt Mercury Nickel Silver	9.7 19.6 46.8 11.3 6.9	Ingestion Inhalation Dermal	31.2 1.4 67.4

Table D6.50. Summary of Risk Characterization for SWMU 217, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	46.8	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.00E-06	Chromium Uranium-238	61.3 37.1	Ingestion Inhalation Dermal External Exposure	3.4 63.0 33.6	<1	Cobalt Nickel Silver	36.2 35.5 22.3	Ingestion Inhalation Dermal	11.1 2.1 86.8
Future Child Resident - surface	9.00E-06	Chromium Uranium-238	61.3 37.1	Ingestion Inhalation Dermal External Exposure	3.4 63.0 33.6	3.00	Cobalt Manganese Nickel Silver	47.8 6.1 27.5 17.2	Ingestion Inhalation Dermal	33.2 3.1 63.7
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Cobalt Nickel Silver	31.5 39.0 24.5	Ingestion Inhalation Dermal	2.0 1.1 96.9

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.51. Summary of Risk Characterization for SWMU 217, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.30E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.32E-05	Arsenic Chromium Total PAH	48.3 14.5 36.8	Ingestion Inhalation Dermal External Exposure	15.4 15.0 69.6	1.80	Cobalt Iron Mercury Nickel Silver	9.2 6.8 53.0 12.6 8.3	Ingestion Inhalation Dermal	5.1 1.3 93.6
Outdoor Worker - surface	3.99E-05	Arsenic Chromium Total PAH	67.5 6.3 26.1	Ingestion Inhalation Dermal External Exposure	63.6 6.4 29.9	1.91	Arsenic Cobalt Iron Mercury Nickel Silver	8.8 15.8 12.0 41.6 9.6 6.3	Ingestion Inhalation Dermal	33.9 0.9 65.2
Outdoor Worker - subsurface	3.45E-05	Arsenic Chromium Total PAH	69.6 4.7 24.2	Ingestion Inhalation Dermal External Exposure	64.4 6.1 29.4	3.20	Antimony Arsenic Cobalt Iron Mercury Nickel Silver	3.6 4.7 45.1 7.0 26.6 4.6 3.8	Ingestion Inhalation Dermal	45.8 0.9 53.2

Table D6.51. Summary of Risk Characterization for SWMU 217, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Cobalt Mercury	45.1 26.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.00E-05	Arsenic Chromium Total PAH	59.2 8.2 32.5	Ingestion Inhalation Dermal External Exposure	40.0 8.4 51.6	3.14	Antimony Arsenic Cobalt Iron Mercury Nickel Silver	3.7 4.4 9.8 7.4 52.1 12.3 8.1	Ingestion Inhalation Dermal	8.1 0.7 91.2
Future Child Resident - surface	8.00E-05	Arsenic Chromium Total PAH	59.2 8.2 32.5	Ingestion Inhalation Dermal External Exposure	40.0 8.4 51.6	9.05	Antimony Arsenic Cobalt Iron Manganese Mercury Nickel Silver	3.4 7.5 14.1 10.6 2.2 44.5 10.4 6.8	Ingestion Inhalation Dermal	26.3 1.1 72.5
Future Teen Recreational User - surface	1.25E-05	Arsenic Total PAH	50.2 44.8	Ingestion Inhalation Dermal External Exposure	5.2 5.0 89.8	2.50	Cobalt Iron Mercury Nickel Silver	8.2 6.2 55.0 13.1 8.6	Ingestion Inhalation Dermal	1.4 0.4 98.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.52. Summary of Risk Characterization for SWMU 221

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.31E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.34E-05	Chromium PCB, Total Total PAH Uranium-238	9.9 11.4 73.8 4.9	Ingestion Inhalation Dermal External Exposure	6.9 10.9 77.9 4.3	<1	Nickel	57.6	Ingestion Inhalation Dermal	5.7 0.5 93.8
Outdoor Worker - surface	2.75E-05	Chromium PCB, Total Total PAH Uranium-238	6.2 11.2 76.6 6.0	Ingestion Inhalation Dermal External Exposure	41.4 6.9 49.0 2.7	<1	Iron Nickel	39.5 42.0	Ingestion Inhalation Dermal	36.9 0.3 62.8
Outdoor Worker - subsurface	5.74E-05	Arsenic Chromium PCB, Total Total PAH Uranium-238	51.9 2.8 5.4 36.7 2.9	Ingestion Inhalation Dermal External Exposure	60.0 3.5 35.3 1.3	3.79	Aluminum Arsenic Barium Cobalt Iron Manganese Mercury Nickel	3.3 4.9 3.2 33.1 7.5 5.9 30.0 4.7	Ingestion Inhalation Dermal	43.7 2.3 54.0

Table D6.52. Summary of Risk Characterization for SWMU 221 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		1.19	Cobalt Mercury	33.1 30.0	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.05E-05	Chromium PCB, Total Total PAH Uranium-238	6.4 11.1 74.6 7.9	Ingestion Inhalation Dermal External Exposure	19.5 7.0 66.3 7.2	<1	Iron Nickel	25.3 55.9	Ingestion Inhalation Dermal	9.1 0.3 90.6
Future Child Resident - surface	7.05E-05	Chromium PCB, Total Total PAH Uranium-238	6.4 11.1 74.6 7.9	Ingestion Inhalation Dermal External Exposure	19.5 7.0 66.3 7.2	1.66	Barium Iron Nickel Uranium	9.5 35.4 46.0 7.1	Ingestion Inhalation Dermal	29.0 0.4 70.6
Future Teen Recreational User - surface	1.37E-05	PCB, Total Total PAH	12.2 83.0	Ingestion Inhalation Dermal External Exposure	2.1 3.4 93.0 1.5	<1	Nickel	59.6	Ingestion Inhalation Dermal	1.6 0.1 98.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.53. Summary of Risk Characterization for SWMU 222

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.45E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.59E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	6.1 28.8 11.6 6.9 44.5	Ingestion Inhalation Dermal External Exposure	9.8 8.4 35.5 46.2	<1	Nickel	87.1	Ingestion Inhalation Dermal	2.8 0.5 96.7
Outdoor Worker - surface	3.54E-05	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	3.3 24.4 10.3 10.4 4.4 47.2	Ingestion Inhalation Dermal External Exposure	51.2 4.5 19.2 25.0	<1	Nickel	76.7	Ingestion Inhalation Dermal	21.5 0.4 78.1
Outdoor Worker - subsurface	5.58E-05	Arsenic Cesium-137 Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	44.0 4.7 2.8 10.7 6.5 4.5 2.8 23.5	Ingestion Inhalation Dermal External Exposure	59.0 3.4 19.5 18.1	<1	Arsenic Nickel	32.5 36.7	Ingestion Inhalation Dermal	46.7 2.9 50.4

Table D6.53. Summary of Risk Characterization for SWMU 222 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.02E-04	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	3.0 21.5 8.9 2.1 8.8 55.6	Ingestion Inhalation Dermal External Exposure	13.5 4.1 23.1 59.2	<1	Nickel	86.2	Ingestion Inhalation Dermal	4.5 0.3 95.2
Future Child Resident - surface	1.02E-04	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	3.0 21.5 8.9 2.1 8.8 55.6	Ingestion Inhalation Dermal External Exposure	13.5 4.1 23.1 59.2	1.11	Nickel Uranium	79.7 18.3	Ingestion Inhalation Dermal	16.1 0.5 83.5
Future Teen Recreational User - surface	9.67E-06	PCB, Total Total PAH Uranium-238	48.4 20.4 23.7	Ingestion Inhalation Dermal External Exposure	3.5 4.1 66.4 26.0	<1	Nickel	88.3	Ingestion Inhalation Dermal	0.7 0.1 99.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.54. Summary of Risk Characterization for SWMU 227, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.79E-06	PCB, Total Uranium-238	32.6 40.2	Ingestion Inhalation Dermal External Exposure	8.7 4.9 35.9 50.5	<1	*no COCs			
Future Industrial Worker - surface	6.77E-05	Cesium-137 Chromium Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	3.3 2.3 4.9 32.6 8.4 5.6 40.2	Ingestion Inhalation Dermal External Exposure	8.7 4.9 35.9 50.5	<1	Nickel	80.7	Ingestion Inhalation Dermal	3.7 0.5 95.8
Outdoor Worker - surface	8.78E-05	Cesium-137 Chromium Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	1.9 1.3 3.1 29.1 7.9 6.2 3.7 45.0	Ingestion Inhalation Dermal External Exposure	47.9 2.8 20.5 28.8	<1	Nickel Uranium	66.8 30.7	Ingestion Inhalation Dermal	26.9 0.4 72.7
Outdoor Worker - subsurface	1.02E-04	Arsenic Cesium-137 Chromium Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	20.0 1.4 1.3 2.4 23.9 6.8 4.9 2.9 35.0	Ingestion Inhalation Dermal External Exposure	53.5 2.5 21.5 22.4	<1	Arsenic Nickel Uranium	17.5 51.7 24.2	Ingestion Inhalation Dermal	37.7 0.4 62.0

Table D6.54. Summary of Risk Characterization for SWMU 227, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.27E-06			See Outdoor Worker (subsurface)		<1	Nickel	51.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.74E-04	Cesium-137	4.1	Ingestion	12.1	1.02	Nickel	79.4	Ingestion	6.0
		Chromium	1.1	Inhalation	2.3		Uranium	17.6	Inhalation	0.3
		Cobalt-60	1.6	Dermal	22.8				Dermal	93.8
		Neptunium-237	6.1	External Exposure	62.9					
		PCB, Total	23.7							
		Total PAH	6.3							
		Uranium-234	1.2							
		Uranium-235	6.9							
		Uranium-238	48.8							
Future Child Resident - surface	2.74E-04	Cesium-137	4.1	Ingestion	12.1	2.77	Nickel	70.7	Ingestion	20.5
		Chromium	1.1	Inhalation	2.3		Uranium	26.6	Inhalation	0.5
		Cobalt-60	1.6	Dermal	22.8				Dermal	79.1
		Neptunium-237	6.1	External Exposure	62.9					
		PCB, Total	23.7							
		Total PAH	6.3							
		Uranium-234	1.2							
		Uranium-235	6.9							
		Uranium-238	48.8							
Future Teen Recreational User - surface	2.55E-05	PCB, Total	54.2	Ingestion	3.1	<1	Nickel	82.3	Ingestion	1.0
		Total PAH	14.7	Inhalation	2.3		Uranium	14.5	Inhalation	0.1
		Uranium-238	21.2	Dermal	66.5				Dermal	98.9
				External Exposure	28.1					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.55. Summary of Risk Characterization for SWMU 227, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.05E-06	PCB, Total	84.8	Ingestion	6.2	<1	*no COCs			
				Inhalation	11.3					
				Dermal	78.1					
				External Exposure	4.4					
Future Industrial Worker - surface	3.66E-05	Chromium	5.1	Ingestion	6.2	1.34	Mercury	69.5	Ingestion	2.5
		PCB, Total	84.8	Inhalation	11.3		Nickel	21.7	Inhalation	0.2
		Total PAH	5.3	Dermal	78.1				Dermal	97.2
				External Exposure	4.4					
Outdoor Worker - surface	4.16E-05	Chromium	3.3	Ingestion	39.0	1.21	Cobalt	12.9	Ingestion	20.0
		PCB, Total	86.3	Inhalation	7.3		Mercury	64.3	Inhalation	0.2
		Total PAH	5.7	Dermal	50.8		Nickel	19.4	Dermal	79.8
		Uranium-238	3.2	External Exposure	2.8					
Outdoor Worker - subsurface	5.50E-05	Arsenic	36.6	Ingestion	53.0	1.50	Arsenic	8.4	Ingestion	26.7
		Chromium	2.0	Inhalation	4.6		Cobalt	12.3	Inhalation	1.0
		PCB, Total	53.3	Dermal	40.1		Mercury	51.5	Dermal	72.3
		Total PAH	4.3	External Exposure	2.3		Nickel	15.5		
		Uranium-238	2.4							

Table D6.55. Summary of Risk Characterization for SWMU 227, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	51.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.09E-04	Chromium Cobalt-60 PCB, Total Total PAH Uranium-238	3.3 3.6 83.4 5.4 4.2	Ingestion Inhalation Dermal External Exposure	18.3 7.4 67.0 7.4	2.32	Cobalt Mercury Nickel	6.9 69.1 21.5	Ingestion Inhalation Dermal	4.1 0.1 95.8
Future Child Resident - surface	1.09E-04	Chromium Cobalt-60 PCB, Total Total PAH Uranium-238	3.3 3.6 83.4 5.4 4.2	Ingestion Inhalation Dermal External Exposure	18.3 7.4 67.0 7.4	5.99	Cobalt Mercury Nickel Uranium	11.0 65.8 20.1 1.8	Ingestion Inhalation Dermal	14.8 0.2 84.9
Future Teen Recreational User - surface	2.15E-05	PCB, Total Total PAH	90.8 6.0	Ingestion Inhalation Dermal External Exposure	1.9 3.5 93.0 1.6	1.92	Cobalt Mercury Nickel	5.6 70.2 21.9	Ingestion Inhalation Dermal	0.7 0.1 99.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.56. Summary of Risk Characterization for SWMU 228

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.30E-05	Chromium Neptunium-237 Total PAH Uranium-238	48.1 22.7 8.7 17.0	Ingestion Inhalation Dermal External Exposure	2.9 48.3 8.0 40.8	1.41	Mercury Nickel Silver	74.1 13.2 7.7	Ingestion Inhalation Dermal	1.7 0.1 98.2
Outdoor Worker - surface	1.21E-05	Chromium Neptunium-237 Total PAH Uranium-238	38.4 20.2 11.4 26.6	Ingestion Inhalation Dermal External Exposure	22.5 38.5 6.4 32.6	1.19	Mercury Nickel	72.9 12.5	Ingestion Inhalation Dermal	14.1 0.1 85.8
Outdoor Worker - subsurface	7.99E-05	Arsenic Chromium Neptunium-237 Total PAH Uranium-238	84.2 5.8 3.1 1.7 4.0	Ingestion Inhalation Dermal External Exposure	68.5 5.9 20.1 5.6	1.95	Arsenic Iron Mercury Nickel	21.5 14.3 44.4 7.6	Ingestion Inhalation Dermal	36.0 1.0 63.0

Table D6.56. Summary of Risk Characterization for SWMU 228 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Arsenic Mercury	21.5 44.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.36E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	27.9 34.0 7.9 5.2 25.0	Ingestion Inhalation Dermal External Exposure	4.5 28.0 6.1 61.4	2.41	Mercury Nickel Silver	74.0 13.1 7.7	Ingestion Inhalation Dermal	2.7 0.1 97.2
Future Child Resident - surface	4.36E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	27.9 34.0 7.9 5.2 25.0	Ingestion Inhalation Dermal External Exposure	4.5 28.0 6.1 61.4	5.99	Antimony Mercury Nickel Silver Uranium	1.9 73.3 12.7 7.4 1.8	Ingestion Inhalation Dermal	10.3 0.1 89.6
Future Teen Recreational User - surface	3.04E-06	Chromium	37.6	Ingestion Inhalation Dermal External Exposure	1.6 37.7 24.0 36.7	2.02	Mercury Nickel Silver	74.3 13.2 7.7	Ingestion Inhalation Dermal	0.4 0.0 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.57. Summary of Risk Characterization for SWMU 27

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface	<1E-6					<1	*no COCs			

Table D6.57. Summary of Risk Characterization for SWMU 27 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

There are no surface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.58. Summary of Risk Characterization for SWMU 76

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.79E-06	Total PAH	93.0	Ingestion Inhalation Dermal External Exposure	7.6 0.5 89.6 2.4	<1	*no COCs			
Future Industrial Worker - surface	3.19E-05	PCB, Total Total PAH	4.3 93.0	Ingestion Inhalation Dermal External Exposure	7.6 0.5 89.6 2.4	<1	*no COCs			
Outdoor Worker - surface	3.91E-05	PCB, Total Total PAH Uranium-238	4.1 92.7 3.2	Ingestion Inhalation Dermal External Exposure	44.1 0.3 54.2 1.4	<1	*no COCs			
Outdoor Worker - subsurface	7.07E-05	Arsenic PCB, Total Total PAH Uranium-238	44.7 2.3 51.3 1.8	Ingestion Inhalation Dermal External Exposure	58.9 0.2 40.1 0.8	<1	Arsenic Mercury	21.3 74.6	Ingestion Inhalation Dermal	26.2 0.1 73.6

Table D6.58. Summary of Risk Characterization for SWMU 76 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	74.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.87E-05	PCB, Total Total PAH Uranium-238	4.1 91.6 4.2	Ingestion Inhalation Dermal External Exposure	21.6 0.3 74.3 3.9	<1	*no COCs			
Future Child Resident - surface	9.87E-05	PCB, Total Total PAH Uranium-238	4.1 91.6 4.2	Ingestion Inhalation Dermal External Exposure	21.6 0.3 74.3 3.9	<1	Barium	100.0	Ingestion Inhalation Dermal	9.0 1.3 89.7
Future Teen Recreational User - surface	2.06E-05	Total PAH	95.0	Ingestion Inhalation Dermal External Exposure	2.1 0.1 97.0 0.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.59. Summary of Risk Characterization for SWMU 165

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.29E-05	Arsenic	27.7	Ingestion	13	<1	*no COCs			
		Cesium-137	17.5	Inhalation	2.4					
		PCB, Total	19.2	Dermal	49.7					
		Total PAH	13.7	External	35					
		Uranium-238	16.4	Exposure						
Future Industrial Worker - surface	2.30E-04	Arsenic	27.7	Ingestion	13	1.14	Arsenic	35.2	Ingestion	11.4
		Cesium-137	17.5	Inhalation	2.4		Silver	25.3	Inhalation	2.3
		Chromium	0.5	Dermal	49.7		Uranium	8.8	Dermal	86.2
		Neptunium-237	0.7	External	35					
		PCB, Total	19.2	Exposure						
		Total PAH	13.7							
		Uranium-234	1.3							
		Uranium-235	2.3							
		Uranium-238	16.4							
Outdoor Worker - surface	3.59E-04	Arsenic	42.6	Ingestion	58.8	1.67	Arsenic	57.2	Ingestion	55.3
		Cesium-137	8.4	Inhalation	1.1		Silver	13.9	Inhalation	1.2
		Neptunium-237	0.4	Dermal	23.5		Uranium	11.1	Dermal	43.5
		PCB, Total	14.2	External	16.5					
		Plutonium-239/240	0.5	Exposure						
		Thorium-230	0.8							
		Total PAH	10.7							
		Uranium-234	5.7							
		Uranium-235	1.3							
		Uranium-238	15.2							
Outdoor Worker - subsurface	3.72E-04	Arsenic	41.3	Ingestion	58.3	1.86	Arsenic	51.6	Ingestion	56.7
		Cesium-137	8.1	Inhalation	1.2		Cobalt	7.9	Inhalation	1.1
		Neptunium-237	0.3	Dermal	24.5		Silver	12.5	Dermal	42.2
		PCB, Total	16.4	External	16.0		Uranium	10.0		
		Pentachlorophenol	0.5	Exposure						
		Plutonium-239/240	0.5							
		Thorium-230	0.7							
		Total PAH	10.4							
		Uranium-234	5.5							
		Uranium-235	1.2							
		Uranium-238	14.7							

Table D6.59. Summary of Risk Characterization for SWMU 165 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	4.65E-06	Arsenic	41.3	See Outdoor Worker (subsurface)		<1	Arsenic	51.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.36E-04	Arsenic	28.8	Ingestion	24.4	2.05	Antimony	7.3	Ingestion	17.7
		Cesium-137	21.7	Inhalation	1.1		Arsenic	38.5	Inhalation	1.2
		Chromium	0.3	Dermal	31.3		Barium	8.2	Dermal	81.1
		Napthalene	0.2	External	43.3		Nickel	6.7		
		Neptunium-237	0.8	Exposure			Silver	23.9		
		PCB, Total	13.8				Uranium	9.2		
		Plutonium-239/240	0.1							
		Thorium-230	0.2							
		Total PAH	10.3							
		Uranium-234	1.3							
		Uranium-235	2.8							
		Uranium-238	19.8							
Future Child Resident - surface	9.36E-04	Arsenic	28.8	Ingestion	24.4	7.33	Antimony	5.4	Ingestion	46.3
		Cesium-137	21.7	Inhalation	1.1		Arsenic	52.7	Inhalation	1.6
		Chromium	0.3	Dermal	31.3		Barium	5.7	Dermal	52.1
		Napthalene	0.2	External	43.3		Mercury	2.4		
		Neptunium-237	0.8	Exposure			Nickel	4.6		
		PCB, Total	13.8				Silver	16.2		
		Plutonium-239/240	0.1				Uranium	10.6		
		Thorium-230	0.2							
		Total PAH	10.3							
		Uranium-234	1.3							
		Uranium-235	2.8							
		Uranium-238	19.8							
Future Teen Recreational User - surface	1.02E-04	Arsenic	35.0	Ingestion	4.8	1.49	Antimony	8.3	Ingestion	3.3
		Cesium-137	8.3	Inhalation	1.0		Arsenic	31.3	Inhalation	0.7
		PCB, Total	27.0	Dermal	77.8		Barium	9.5	Dermal	96.0
		Total PAH	20.3	External	16.5		Nickel	7.8		
		Uranium-235	1.1	Exposure			Silver	27.9		
		Uranium-238	7.3				Uranium	8.5		

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.60. Summary of Risk Characterization for SWMU 170

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs					*no COCs			
Future Industrial Worker - surface	1.32E-06	*no COCs					*no COCs			
Outdoor Worker - surface	1.66E-06	Uranium-238	78.8	Ingestion	45.6		*no COCs			
				Inhalation	0.1					
				Dermal						
				External Exposure	54.3					
Outdoor Worker - subsurface	5.83E-06	Cesium-137	49.9	Ingestion	21.7		*no COCs			
		Uranium-238	37.3	Inhalation	0.1					
				Dermal						
				External Exposure	78.3					

Table D6.60. Summary of Risk Characterization for SWMU 170 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.55E-06	Neptunium-237 Uranium-238	32.5 67.5	Ingestion Inhalation Dermal External Exposure	6.5 0.1 93.4		*no COCs			
Future Child Resident - surface	6.55E-06	Neptunium-237 Uranium-238	32.5 67.5	Ingestion Inhalation Dermal External Exposure	6.5 0.1 93.4		*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs					*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.61. Summary of Risk Characterization for SWMU 158

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.18E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.11E-05	Arsenic Chromium Total PAH Uranium-238	48.1 9.5 29.5 10.6	Ingestion Inhalation Dermal External Exposure	16.0 10.0 62.7 11.3	1.68	Cobalt Mercury Nickel	9.1 69.1 10.1	Ingestion Inhalation Dermal	4.3 1.6 94.1
Outdoor Worker - surface	3.71E-05	Arsenic Chromium Total PAH Uranium-238	65.7 4.0 20.5 8.7	Ingestion Inhalation Dermal External Exposure	64.7 4.2 26.4 4.7	1.70	Arsenic Cobalt Mercury Nickel	8.9 16.6 56.9 8.1	Ingestion Inhalation Dermal	29.9 1.2 68.9
Outdoor Worker - subsurface	3.73E-05	Arsenic Chromium Total PAH Uranium-238	61.5 3.4 26.5 7.2	Ingestion Inhalation Dermal External Exposure	63.3 3.5 28.8 4.4	1.73	Arsenic Cobalt Mercury Nickel	8.3 12.6 56.1 8.9	Ingestion Inhalation Dermal	27.3 1.2 71.5

Table D6.61. Summary of Risk Characterization for SWMU 158 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	56.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.90E-05	Arsenic Chromium Total PAH Uranium-235 Uranium-238	54.4 4.9 24.0 2.6 13.9	Ingestion Inhalation Dermal External Exposure	36.7 5.2 42.9 15.2	2.92	Arsenic Cobalt Mercury Nickel	4.3 9.9 68.3 10.0	Ingestion Inhalation Dermal	6.9 0.9 92.3
Future Child Resident - surface	7.90E-05	Arsenic Chromium Total PAH Uranium-235 Uranium-238	54.4 4.9 24.0 2.6 13.9	Ingestion Inhalation Dermal External Exposure	36.7 5.2 42.9 15.2	8.16	Arsenic Barium Cobalt Manganese Mercury Nickel Uranium	7.5 1.9 14.6 2.9 60.1 8.6 1.8	Ingestion Inhalation Dermal	23.0 1.4 75.6
Future Teen Recreational User - surface	1.07E-05	Arsenic Total PAH	53.3 38.3	Ingestion Inhalation Dermal External Exposure	5.6 3.6 86.2 4.7	2.34	Cobalt Mercury Nickel	8.2 71.4 10.4	Ingestion Inhalation Dermal	1.2 0.4 98.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.62. Summary of Risk Characterization for SWMU 169

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	9.22E-06	Arsenic PCB, Total Total PAH	12.4 32.4 47.1	Ingestion Inhalation Dermal External Exposure	9.4 6.8 80.5 3.3	<1	*no COCs			
Future Industrial Worker - surface	1.65E-04	Arsenic Chromium PCB, Total Total PAH Uranium-235 Uranium-238	12.4 4.3 32.4 47.1 0.7 2.9	Ingestion Inhalation Dermal External Exposure	9.4 6.8 80.5 3.3	2.68	Arsenic Iron Mercury Nickel	4.8 6.2 32.7 47.9	Ingestion Inhalation Dermal	4.2 0.4 95.4
Outdoor Worker - surface	2.21E-04	Arsenic Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	22.2 2.4 27.9 42.8 1.0 0.5 3.1	Ingestion Inhalation Dermal External Exposure	50.0 3.7 44.4 1.8	2.70	Arsenic Iron Mercury Nickel	11.3 11.4 27.0 38.3	Ingestion Inhalation Dermal	29.7 0.3 70.0
Outdoor Worker - subsurface	2.21E-04	Arsenic Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	22.1 2.4 27.9 42.7 1.0 0.5 3.1	Ingestion Inhalation Dermal External Exposure	49.9 3.8 44.3 1.9	4.77	Aluminum Arsenic Cobalt Iron Mercury Nickel	2.3 6.4 28.5 6.5 15.3 31.8	Ingestion Inhalation Dermal	38.9 1.0 60.1

Table D6.62. Summary of Risk Characterization for SWMU 169 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.77E-06	Total PAH	42.7	See Outdoor Worker (subsurface)		1.49	Cobalt Mercury Nickel	28.5 15.3 31.8	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.23E-04	Arsenic Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	16.5 2.6 29.9 45.1 0.3 1.1 4.5	Ingestion Inhalation Dermal External Exposure	25.8 4.1 64.9 5.2	4.66	Arsenic Iron Mercury Nickel	5.4 6.7 32.2 46.9	Ingestion Inhalation Dermal	6.8 0.2 93.0
Future Child Resident - surface	5.23E-04	Arsenic Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	16.5 2.6 29.9 45.1 0.3 1.1 4.5	Ingestion Inhalation Dermal External Exposure	25.8 4.1 64.9 5.2	12.93	Aluminum Antimony Arsenic Chromium Copper Iron Mercury Nickel Thallium Uranium	2.5 1.8 9.5 0.8 1.6 10.0 28.5 40.9 1.0 2.8	Ingestion Inhalation Dermal	22.8 0.4 76.8
Future Teen Recreational User - surface	9.84E-05	Arsenic Chromium PCB, Total Total PAH	11.6 1.3 34.0 51.8	Ingestion Inhalation Dermal External Exposure	2.8 2.1 94.0 1.1	3.76	Arsenic Iron Mercury Nickel	4.0 5.6 33.5 49.0	Ingestion Inhalation Dermal	1.1 0.1 98.7

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.63. Summary of Risk Characterization for SWMU 19

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.94E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	7.6 0.2 92.3	<1	*no COCs			
Future Industrial Worker - surface	8.83E-05	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	7.6 0.2 92.3	<1	*no COCs			
Outdoor Worker - surface	1.08E-04	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	44.0 0.1 56.0	<1	*no COCs			
Outdoor Worker - subsurface	1.71E-04	Arsenic Total PAH Uranium-234 Uranium-235 Uranium-238	14.2 63.0 5.7 1.7 15.3	Ingestion Inhalation Dermal External Exposure	53.0 0.2 38.5 8.3	1.88	Arsenic Cobalt Copper Nickel Uranium	8.1 12.5 12.4 43.9 15.1	Ingestion Inhalation Dermal	41.9 0.4 57.7

Table D6.63. Summary of Risk Characterization for SWMU 19 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.14E-06	Total PAH	63.0	See Outdoor Worker (subsurface)		<1	Nickel	43.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.69E-04	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	*no COCs			
Future Child Resident - surface	2.69E-04	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	Beryllium Thallium	26.7 67.1	Ingestion Inhalation Dermal	45.1 0.2 54.6
Future Teen Recreational User - surface	5.81E-05	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	2.1 0.0 97.9	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.64. Summary of Risk Characterization for SWMU 138, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.68E-05	Arsenic Chromium PCB, Total Total PAH	63.6 10.7 15.9 9.8	Ingestion Inhalation Dermal External Exposure	18.4 12.0 69.6	2.00	Antimony Mercury Nickel	10.7 72.1 8.2	Ingestion Inhalation Dermal	2.5 0.1 97.4
Outdoor Worker - surface	3.20E-05	Arsenic Chromium PCB, Total Total PAH	79.9 4.1 9.6 6.3	Ingestion Inhalation Dermal External Exposure	68.4 4.6 27.0	1.80	Antimony Arsenic Mercury Nickel	11.1 8.9 66.7 7.4	Ingestion Inhalation Dermal	19.9 0.1 80.0
Outdoor Worker - subsurface	3.25E-05	Arsenic Chromium PCB, Total Total PAH	79.9 4.3 9.5 6.2	Ingestion Inhalation Dermal External Exposure	68.3 4.9 26.8	2.43	Antimony Arsenic Cobalt Iron Mercury Nickel	6.9 6.7 6.6 6.0 55.4 6.0	Ingestion Inhalation Dermal	28.0 0.6 71.3

Table D6.64. Summary of Risk Characterization for SWMU 138, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	55.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.14E-05	Arsenic Chromium PCB, Total Total PAH	73.4 5.6 12.8 8.2	Ingestion Inhalation Dermal External Exposure	45.0 6.3 48.7	3.45	Antimony Arsenic Mercury Nickel Silver	10.7 3.8 71.7 8.1 4.6	Ingestion Inhalation Dermal	4.1 0.1 95.8
Future Child Resident - surface	6.14E-05	Arsenic Chromium PCB, Total Total PAH	73.4 5.6 12.8 8.2	Ingestion Inhalation Dermal External Exposure	45.0 6.3 48.7	8.91	Antimony Arsenic Cadmium Mercury Nickel Silver	11.0 7.2 1.2 68.3 7.6 4.3	Ingestion Inhalation Dermal	14.8 0.1 85.1
Future Teen Recreational User - surface	9.07E-06	Arsenic PCB, Total Total PAH	66.0 18.4 11.9	Ingestion Inhalation Dermal External Exposure	6.2 4.0 89.8	2.86	Antimony Mercury Nickel Silver	10.6 72.8 8.3 4.7	Ingestion Inhalation Dermal	0.7 0.0 99.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.65. Summary of Risk Characterization for SWMU 138, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.15E-06	*no COCs				<1	Nickel	65.8	Ingestion Inhalation Dermal	1.0 0.3 98.6
Outdoor Worker - surface	1.37E-06	*no COCs				<1	Nickel	65.8	Ingestion Inhalation Dermal	9.2 0.3 90.4
Outdoor Worker - subsurface	2.78E-05	Arsenic Chromium	89.5 5.5	Ingestion Inhalation Dermal External Exposure	71.3 5.7 23.0	1.25	Arsenic Mercury Nickel Silver	12.5 61.7 14.5 9.2	Ingestion Inhalation Dermal	20.7 0.1 79.2

Table D6.65. Summary of Risk Characterization for SWMU 138, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	61.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.43E-06	PCB, Total Total PAH	42.0 57.5	Ingestion Inhalation Dermal External Exposure	21.2 2.5 76.3	<1	Nickel Silver	65.7 34.3	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	3.43E-06	PCB, Total Total PAH	42.0 57.5	Ingestion Inhalation Dermal External Exposure	21.2 2.5 76.3	1.17	Nickel Silver	65.8 34.2	Ingestion Inhalation Dermal	6.6 0.4 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	65.7 34.3	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.66. Summary of Risk Characterization for SWMU 180, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.30E-06	Arsenic	97.6	Ingestion Inhalation Dermal External Exposure	25.5 2.6 71.9	<1	*no COCs			
Future Industrial Worker - surface	7.69E-05	Arsenic Chromium	97.6 2.4	Ingestion Inhalation Dermal External Exposure	25.5 2.6 71.9	1.63	Arsenic Mercury Nickel	29.0 56.6 12.6	Ingestion Inhalation Dermal	8.5 0.4 91.1
Outdoor Worker - surface	1.82E-04	Arsenic Chromium	99.2 0.7	Ingestion Inhalation Dermal External Exposure	76.7 0.8 22.5	2.08	Arsenic Mercury Nickel	54.0 36.8 7.9	Ingestion Inhalation Dermal	47.2 0.2 52.6
Outdoor Worker - subsurface	1.84E-04	Arsenic Chromium	99.1 0.8	Ingestion Inhalation Dermal External Exposure	76.6 0.9 22.5	2.51	Arsenic Cobalt Mercury Nickel	45.3 9.5 30.5 6.8	Ingestion Inhalation Dermal	47.9 0.8 51.3

Table D6.66. Summary of Risk Characterization for SWMU 180, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.30E-06	Arsenic	99.1	See Outdoor Worker (subsurface)		<1	Arsenic Mercury	45.3 30.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.21E-04	Arsenic Chromium	98.9 1.1	Ingestion Inhalation Dermal External Exposure	54.7 1.2 44.1	2.91	Arsenic Mercury Nickel	32.0 54.2 12.0	Ingestion Inhalation Dermal	13.3 0.2 86.5
Future Child Resident - surface	3.21E-04	Arsenic Chromium	98.9 1.1	Ingestion Inhalation Dermal External Exposure	54.7 1.2 44.1	9.41	Antimony Arsenic Mercury Nickel	1.1 48.4 41.3 9.0	Ingestion Inhalation Dermal	38.4 0.3 61.3
Future Teen Recreational User - surface	4.25E-05	Arsenic	99.2	Ingestion Inhalation Dermal External Exposure	8.4 0.8 90.8	2.21	Arsenic Mercury Nickel	24.8 59.9 13.3	Ingestion Inhalation Dermal	2.4 0.1 97.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.67. Summary of Risk Characterization for SWMU 180, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.57E-05	Arsenic Chromium Total PAH	80.7 9.4 9.9	Ingestion Inhalation Dermal External Exposure	21.8 9.6 68.6	<1	Nickel	65.6	Ingestion Inhalation Dermal	7.8 0.7 91.6
Outdoor Worker - surface	3.35E-05	Arsenic Chromium Total PAH	91.1 3.3 5.7	Ingestion Inhalation Dermal External Exposure	72.8 3.3 23.8	<1	Arsenic Nickel	51.5 42.9	Ingestion Inhalation Dermal	44.7 0.4 54.9
Outdoor Worker - subsurface	3.15E-05	Arsenic Chromium Total PAH	89.3 4.7 6.0	Ingestion Inhalation Dermal External Exposure	71.6 4.8 23.6	1.16	Arsenic Mercury Nickel	15.2 65.9 14.0	Ingestion Inhalation Dermal	23.0 1.1 75.9

Table D6.67. Summary of Risk Characterization for SWMU 180, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	65.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.13E-05	Arsenic Chromium Total PAH	87.6 4.7 7.7	Ingestion Inhalation Dermal External Exposure	50.1 4.8 45.1	<1	Arsenic Nickel	29.5 62.9	Ingestion Inhalation Dermal	12.2 0.3 87.4
Future Child Resident - surface	6.13E-05	Arsenic Chromium Total PAH	87.6 4.7 7.7	Ingestion Inhalation Dermal External Exposure	50.1 4.8 45.1	1.68	Arsenic Nickel	45.7 48.2	Ingestion Inhalation Dermal	36.1 0.5 63.4
Future Teen Recreational User - surface	8.43E-06	Arsenic Total PAH	84.7 12.1	Ingestion Inhalation Dermal External Exposure	7.4 3.3 89.3	<1	Nickel	69.1	Ingestion Inhalation Dermal	2.2 0.2 97.7

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.68. Summary of Risk Characterization for SWMU 180, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.50E-05	Arsenic Chromium	89.5 10.4	Ingestion Inhalation Dermal External Exposure	23.4 10.6 66.0	<1	Nickel Silver	44.7 29.9	Ingestion Inhalation Dermal	6.9 0.5 92.5
Outdoor Worker - surface	3.33E-05	Arsenic Chromium	96.5 3.5	Ingestion Inhalation Dermal External Exposure	74.6 3.5 21.9	<1	Arsenic Nickel	48.0 30.5	Ingestion Inhalation Dermal	41.7 0.3 58.0
Outdoor Worker - subsurface	3.41E-05	Arsenic Chromium	96.1 3.9	Ingestion Inhalation Dermal External Exposure	74.2 4.0 21.8	<1	Arsenic Nickel	41.7 27.5	Ingestion Inhalation Dermal	43.1 2.0 54.9

Table D6.68. Summary of Risk Characterization for SWMU 180, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.97E-05	Arsenic Chromium	94.9 5.1	Ingestion Inhalation Dermal External Exposure	52.5 5.2 42.4	<1	Arsenic Nickel Silver	26.5 43.1 28.9	Ingestion Inhalation Dermal	11.0 0.3 88.8
Future Child Resident - surface	5.97E-05	Arsenic Chromium	94.9 5.1	Ingestion Inhalation Dermal External Exposure	52.5 5.2 42.4	1.92	Arsenic Nickel Silver	42.2 33.9 22.7	Ingestion Inhalation Dermal	33.4 0.4 66.2
Future Teen Recreational User - surface	7.82E-06	Arsenic	96.4	Ingestion Inhalation Dermal External Exposure	8.2 3.7 88.1	<1	Nickel Silver	46.8 31.4	Ingestion Inhalation Dermal	1.9 0.1 97.9

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.69. Summary of Risk Characterization for SWMU 180, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.39E-05	Arsenic Chromium	83.0 14.3	Ingestion Inhalation Dermal External Exposure	21.9 14.5 63.6	<1	Nickel	30.3	Ingestion Inhalation Dermal	8.1 3.6 88.4
Outdoor Worker - surface	2.97E-05	Arsenic Chromium	93.5 5.0	Ingestion Inhalation Dermal External Exposure	72.9 5.0 22.1	<1	Arsenic Iron Nickel	27.7 18.2 19.5	Ingestion Inhalation Dermal	45.7 2.1 52.2
Outdoor Worker - subsurface	2.85E-05	Arsenic Chromium	93.6 5.2	Ingestion Inhalation Dermal External Exposure	72.8 5.3 21.9	1.43	Arsenic Cobalt Iron Mercury Nickel	11.6 11.8 8.3 44.6 9.2	Ingestion Inhalation Dermal	32.8 1.1 66.1

Table D6.69. Summary of Risk Characterization for SWMU 180, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	44.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.39E-05	Arsenic Chromium Total PAH	90.8 7.2 2.1	Ingestion Inhalation Dermal External Exposure	50.6 7.3 42.1	<1	Arsenic Iron Nickel Silver	16.3 13.2 29.3 17.5	Ingestion Inhalation Dermal	12.8 1.9 85.3
Future Child Resident - surface	5.39E-05	Arsenic Chromium Total PAH	90.8 7.2 2.1	Ingestion Inhalation Dermal External Exposure	50.6 7.3 42.1	2.84	Arsenic Barium Beryllium Iron Manganese Nickel Silver Vanadium	24.7 5.3 5.4 16.8 5.9 21.9 13.1 5.9	Ingestion Inhalation Dermal	37.0 2.7 60.3
Future Teen Recreational User - surface	7.11E-06	Arsenic	91.5	Ingestion Inhalation Dermal External Exposure	7.8 5.2 87.0	<1	Nickel Silver	32.7 19.6	Ingestion Inhalation Dermal	2.3 1.0 96.7

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.70. Summary of Risk Characterization for SWMU 181

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.34E-06	*no COCs				<1	Thallium	97.8	Ingestion Inhalation Dermal	17.2 82.8
Outdoor Worker - surface	1.27E-06	*no COCs				<1	Thallium	99.1	Ingestion Inhalation Dermal	66.6 33.4
Outdoor Worker - subsurface	2.19E-06					<1	Thallium	98.7	Ingestion Inhalation Dermal	66.3 33.7

Table D6.70. Summary of Risk Characterization for SWMU 181 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.23E-06	Chromium Total PAH	45.4 54.6	Ingestion Inhalation Dermal External Exposure	12.1 45.5 42.4	<1	Thallium	98.0	Ingestion Inhalation Dermal	25.5 74.5
Future Child Resident - surface	3.23E-06	Chromium Total PAH	45.4 54.6	Ingestion Inhalation Dermal External Exposure	12.1 45.5 42.4	<1	Thallium	98.9	Ingestion Inhalation Dermal	58.2 41.8
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Thallium	97.5	Ingestion Inhalation Dermal	5.1 94.9

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.71. Summary of Risk Characterization for SWMU 195, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.10E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	63.4	Ingestion Inhalation Dermal	1.0 0.3 98.6
Outdoor Worker - surface	1.56E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	63.5	Ingestion Inhalation Dermal	9.1 0.3 90.6
Outdoor Worker - subsurface	3.32E-05	Arsenic Cesium-137 Chromium	85.1 9.7 4.3	Ingestion Inhalation Dermal External Exposure	66.2 4.4 19.8 9.6	<1	Arsenic Nickel	41.8 35.7	Ingestion Inhalation Dermal	40.1 0.3 59.5

Table D6.71. Summary of Risk Characterization for SWMU 195, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.08E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	63.4 33.7	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	4.08E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	1.07	Nickel Silver	63.5 33.7	Ingestion Inhalation Dermal	6.5 0.4 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	63.3 33.8	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.72. Summary of Risk Characterization for SWMU 195, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.95E-06	Chromium	76.8	Ingestion Inhalation Dermal External Exposure	1.8 76.8 21.4	<1	*no COCs			
Outdoor Worker - surface	1.66E-06	Chromium	66.7	Ingestion Inhalation Dermal External Exposure	14.6 66.8 18.6	<1	*no COCs			
Outdoor Worker - subsurface	1.78E-06	Chromium	77.6	Ingestion Inhalation Dermal External Exposure	9.8 77.7 12.5	<1	*no COCs			

Table D6.72. Summary of Risk Characterization for SWMU 195, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.29E-06	Chromium Total PAH	67.8 32.2	Ingestion Inhalation Dermal External Exposure	7.1 67.9 25.0	<1	Silver	94.3	Ingestion Inhalation Dermal	1.7 98.3
Future Child Resident - surface	4.29E-06	Chromium Total PAH	67.8 32.2	Ingestion Inhalation Dermal External Exposure	7.1 67.9 25.0	<1	Silver	94.5	Ingestion Inhalation Dermal	6.4 93.6
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Silver	94.3	Ingestion Inhalation Dermal	0.3 99.7

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.73. Summary of Risk Characterization for SWMU 195, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.36E-06	Chromium	70.7	Ingestion Inhalation Dermal External Exposure	2.2 71.0 26.8	<1	Nickel	95.3	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	2.07E-06	Chromium	59.5	Ingestion Inhalation Dermal External Exposure	17.7 59.7 22.6	<1	*no COCs			
Outdoor Worker - subsurface	2.81E-05	Arsenic Chromium	92.9 4.6	Ingestion Inhalation Dermal External Exposure	72.9 4.7 22.4	<1	Arsenic Nickel	43.6 48.5	Ingestion Inhalation Dermal	41.3 2.5 56.2

Table D6.73. Summary of Risk Characterization for SWMU 195, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.33E-06	Chromium Total PAH	60.6 39.2	Ingestion Inhalation Dermal External Exposure	8.7 60.9 30.4	<1	Nickel	95.4	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	5.33E-06	Chromium Total PAH	60.6 39.2	Ingestion Inhalation Dermal External Exposure	8.7 60.9 30.4	<1	Nickel	95.5	Ingestion Inhalation Dermal	6.4 0.5 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	95.3	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.74. Summary of Risk Characterization for SWMU 195, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.76E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.9	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.30E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.1	Ingestion Inhalation Dermal	9.0 0.5 90.6
Outdoor Worker - subsurface	2.55E-05	Arsenic Chromium	95.1 4.9	Ingestion Inhalation Dermal External Exposure	73.5 4.9 21.6	<1	Arsenic Nickel	37.7 39.2	Ingestion Inhalation Dermal	37.9 0.3 61.8

Table D6.74. Summary of Risk Characterization for SWMU 195, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.41E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.9	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	3.41E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.0	Ingestion Inhalation Dermal	6.4 0.5 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	95.8	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.75. Summary of Risk Characterization for SWMU 195, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.32E-06	Chromium	82.1	Ingestion Inhalation Dermal External Exposure	1.3 82.5 16.1	<1	Nickel	96.5	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.91E-06	Chromium	73.8	Ingestion Inhalation Dermal External Exposure	11.4 74.1 14.5	<1	Nickel	96.7	Ingestion Inhalation Dermal	9.0 0.5 90.5
Outdoor Worker - subsurface	2.61E-05	Arsenic Cesium-137 Chromium	81.3 11.3 5.4	Ingestion Inhalation Dermal External Exposure	63.8 5.5 19.5 11.2	<1	Arsenic Nickel	34.0 39.3	Ingestion Inhalation Dermal	37.5 0.3 62.2

Table D6.75. Summary of Risk Characterization for SWMU 195, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.94E-06	Chromium Total PAH	74.7 25.0	Ingestion Inhalation Dermal External Exposure	5.5 75.0 19.4	<1	Nickel	96.5	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	4.94E-06	Chromium Total PAH	74.7 25.0	Ingestion Inhalation Dermal External Exposure	5.5 75.0 19.4	<1	Nickel	96.7	Ingestion Inhalation Dermal	6.5 0.5 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	96.5	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.76. Summary of Risk Characterization for SWMU 195, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.67E-06	Chromium Total PAH	26.0 73.8	Ingestion Inhalation Dermal External Exposure	5.6 26.3 68.1	<1	Nickel	97.5	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	6.21E-06	Chromium Total PAH	17.6 82.3	Ingestion Inhalation Dermal External Exposure	36.2 17.8 46.0	<1	Nickel	97.6	Ingestion Inhalation Dermal	9.1 0.5 90.5
Outdoor Worker - subsurface	3.25E-05	Arsenic Cesium-137 Chromium Total PAH	77.7 6.0 4.2 12.1	Ingestion Inhalation Dermal External Exposure	65.4 4.2 24.4 6.0	<1	Arsenic Nickel	37.3 43.7	Ingestion Inhalation Dermal	34.5 0.3 65.2

Table D6.76. Summary of Risk Characterization for SWMU 195, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.56E-05	Chromium Total PAH	18.3 81.6	Ingestion Inhalation Dermal External Exposure	18.1 18.5 63.4	<1	Nickel	97.5	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	1.56E-05	Chromium Total PAH	18.3 81.6	Ingestion Inhalation Dermal External Exposure	18.1 18.5 63.4	<1	Nickel	97.6	Ingestion Inhalation Dermal	6.5 0.5 92.9
Future Teen Recreational User - surface	3.03E-06	Total PAH	91.1	Ingestion Inhalation Dermal External Exposure	1.9 9.0 89.1	<1	Nickel	97.5	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.77. Summary of Risk Characterization for SWMU 195, EU 7

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.63E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.21E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.17E-05	Arsenic Chromium	94.5 5.4	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic Cobalt	32.8 50.6	Ingestion Inhalation Dermal	60.4 0.5 39.1

Table D6.77. Summary of Risk Characterization for SWMU 195, EU 7 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.17E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Silver	92.8	Ingestion Inhalation Dermal	1.6 98.4
Future Child Resident - surface	3.17E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Silver	93.1	Ingestion Inhalation Dermal	6.3 93.7
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Silver	92.7	Ingestion Inhalation Dermal	0.3 99.7

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.78. Summary of Risk Characterization for SWMU 195, EU 8

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.76E-05	Arsenic Chromium Total PAH	66.0 12.8 20.7	Ingestion Inhalation Dermal External Exposure	18.8 13.4 67.8	<1	Cobalt Nickel	38.5 36.6	Ingestion Inhalation Dermal	12.1 1.1 86.7
Outdoor Worker - surface	3.40E-05	Arsenic Chromium Total PAH	81.9 4.9 13.1	Ingestion Inhalation Dermal External Exposure	69.0 5.1 25.9	<1	Arsenic Cobalt Nickel	25.7 46.7 19.5	Ingestion Inhalation Dermal	57.0 0.6 42.4
Outdoor Worker - subsurface	3.32E-05	Arsenic Cesium-137 Chromium Total PAH	80.8 6.4 3.9 8.8	Ingestion Inhalation Dermal External Exposure	66.4 4.0 23.3 6.3	<1	Arsenic Cobalt Nickel	23.0 33.6 23.1	Ingestion Inhalation Dermal	49.1 2.0 48.9

Table D6.78. Summary of Risk Characterization for SWMU 195, EU 8 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.47E-05	Arsenic Chromium Total PAH	75.9 6.8 17.1	Ingestion Inhalation Dermal External Exposure	45.8 7.0 47.2	<1	Arsenic Cobalt Nickel	17.6 39.6 34.2	Ingestion Inhalation Dermal	18.6 0.6 80.8
Future Child Resident - surface	6.47E-05	Arsenic Chromium Total PAH	75.9 6.8 17.1	Ingestion Inhalation Dermal External Exposure	45.8 7.0 47.2	2.96	Arsenic Cobalt Nickel Vanadium	23.8 45.1 22.9 4.8	Ingestion Inhalation Dermal	48.1 0.8 51.2
Future Teen Recreational User - surface	9.34E-06	Arsenic Total PAH	69.8 25.7	Ingestion Inhalation Dermal External Exposure	6.4 4.6 89.0	<1	Cobalt Nickel	36.7 40.1	Ingestion Inhalation Dermal	3.5 0.3 96.2

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.79. Summary of Risk Characterization for SWMU 195, EU 9

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.02E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.3	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.50E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.5	Ingestion Inhalation Dermal	9.0 0.5 90.5
Outdoor Worker - subsurface	2.64E-05	Arsenic Chromium	94.3 5.6	Ingestion Inhalation Dermal External Exposure	72.9 5.7 21.4	<1	Arsenic Nickel	38.6 42.7	Ingestion Inhalation Dermal	35.3 0.3 64.4

Table D6.79. Summary of Risk Characterization for SWMU 195, EU 9 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.93E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.3	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	3.93E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.4	Ingestion Inhalation Dermal	6.5 0.5 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	96.2	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.80. Summary of Risk Characterization for SWMU 195, EU 10

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.50E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	57.6 40.6	Ingestion Inhalation Dermal	1.0 0.3 98.7
Outdoor Worker - surface	1.11E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	57.7	Ingestion Inhalation Dermal	9.1 0.3 90.6
Outdoor Worker - subsurface	2.47E-05	Arsenic Chromium	95.7 4.2	Ingestion Inhalation Dermal External Exposure	74.0 4.3 21.7	<1	Arsenic Nickel	35.2 35.8	Ingestion Inhalation Dermal	34.9 1.8 63.4

Table D6.80. Summary of Risk Characterization for SWMU 195, EU 10 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.91E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel Silver	57.6 40.7	Ingestion Inhalation Dermal	1.7 0.2 98.1
Future Child Resident - surface	2.91E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	1.24	Nickel Silver	57.7 40.6	Ingestion Inhalation Dermal	6.6 0.3 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel Silver	57.5 40.7	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.81. Summary of Risk Characterization for SWMU 195, EU 11

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.53E-05	Arsenic Chromium	88.4 11.0	Ingestion Inhalation Dermal External Exposure	23.1 11.8 65.1	<1	Cobalt Nickel	32.8 19.7	Ingestion Inhalation Dermal	13.6 1.8 84.6
Outdoor Worker - surface	3.38E-05	Arsenic Chromium	96.1 3.7	Ingestion Inhalation Dermal External Exposure	74.2 4.0 21.8	1.29	Aluminum Arsenic Cobalt Iron Nickel	11.7 15.7 37.4 11.3 9.9	Ingestion Inhalation Dermal	60.3 0.8 38.9
Outdoor Worker - subsurface	3.51E-05	Arsenic Cesium-137 Chromium	88.9 5.3 4.0	Ingestion Inhalation Dermal External Exposure	69.5 4.2 21.1 5.2	1.15	Aluminum Arsenic Cobalt Iron Nickel	9.0 16.9 28.2 13.5 13.7	Ingestion Inhalation Dermal	55.1 1.4 43.5

Table D6.81. Summary of Risk Characterization for SWMU 195, EU 11 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Cobalt	28.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.06E-05	Arsenic Chromium	94.3 5.4	Ingestion Inhalation Dermal External Exposure	52.1 5.8 42.1	1.47	Aluminum Arsenic Barium Cobalt Iron Nickel	10.5 11.4 8.9 33.5 10.1 18.4	Ingestion Inhalation Dermal	20.8 0.9 78.3
Future Child Resident - surface	6.06E-05	Arsenic Chromium	94.3 5.4	Ingestion Inhalation Dermal External Exposure	52.1 5.8 42.1	5.55	Aluminum Arsenic Barium Cobalt Iron Nickel Thallium Vanadium	11.5 14.7 5.8 36.5 11.0 11.8 3.2 5.0	Ingestion Inhalation Dermal	51.4 1.1 47.5
Future Teen Recreational User - surface	7.92E-06	Arsenic	95.9	Ingestion Inhalation Dermal External Exposure	8.1 4.1 87.7	1.03	Aluminum Barium Cobalt Nickel	9.8 10.6 31.8 22.0	Ingestion Inhalation Dermal	4.0 0.5 95.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.82. Summary of Risk Characterization for SWMU 195, EU 12

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.34E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	86.0	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.73E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	86.2	Ingestion Inhalation Dermal	8.9 0.4 90.6
Outdoor Worker - subsurface	2.75E-05	Arsenic Chromium	94.2 5.8	Ingestion Inhalation Dermal External Exposure	72.8 5.8 21.4	<1	Arsenic Nickel	39.6 42.4	Ingestion Inhalation Dermal	43.8 2.3 53.9

Table D6.82. Summary of Risk Characterization for SWMU 195, EU 12 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.54E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	86.0	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	4.54E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	86.2	Ingestion Inhalation Dermal	6.4 0.5 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	85.9	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.

Table D6.83. Summary of Risk Characterization for SWMU 195, EU 13

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.18E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.4	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.61E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.7	Ingestion Inhalation Dermal	8.9 0.5 90.6
Outdoor Worker - subsurface	2.33E-05	Arsenic Chromium	94.5 5.5	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic Nickel	37.6 43.1	Ingestion Inhalation Dermal	34.7 0.3 65.0

Table D6.83. Summary of Risk Characterization for SWMU 195, EU 13 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.23E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.4	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	4.23E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.6	Ingestion Inhalation Dermal	6.4 0.5 93.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	95.4	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.84. Summary of Risk Characterization for SWMU 195, EU 14

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.98E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.9	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.46E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.1	Ingestion Inhalation Dermal	9.0 0.5 90.6
Outdoor Worker - subsurface	2.61E-05	Arsenic Chromium	94.4 5.6	Ingestion Inhalation Dermal External Exposure	72.9 5.7 21.4	<1	Arsenic Mercury Nickel	15.7 61.2 15.8	Ingestion Inhalation Dermal	21.8 0.1 78.0

Table D6.84. Summary of Risk Characterization for SWMU 195, EU 14 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	61.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.84E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	95.9	Ingestion Inhalation Dermal	1.7 0.3 98.1
Future Child Resident - surface	3.84E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	96.1	Ingestion Inhalation Dermal	6.4 0.5 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	95.9	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.85. Summary of Risk Characterization for SWMU 195, EU 15

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.60E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - surface	1.18E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - subsurface	2.56E-05	Arsenic Cesium-137 Chromium	86.0 8.8 5.1	Ingestion Inhalation Dermal External Exposure	66.6 5.2 19.5 8.7	<1	Arsenic	96.6	Ingestion Inhalation Dermal	74.5 0.3 25.1

Table D6.85. Summary of Risk Characterization for SWMU 195, EU 15 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.10E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.10E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.86. Summary of Risk Characterization for SWMU 195, EU 16

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.48E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	97.3	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.10E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	97.5	Ingestion Inhalation Dermal	9.1 0.5 90.5
Outdoor Worker - subsurface	3.84E-06	Cesium-137 Chromium	66.5 33.4	Ingestion Inhalation Dermal External Exposure	0.7 33.5 65.7	<1	Mercury Nickel	80.7 16.7	Ingestion Inhalation Dermal	12.6 0.7 86.6

Table D6.86. Summary of Risk Characterization for SWMU 195, EU 16 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	80.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.88E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	97.3	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	2.88E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	Nickel	97.4	Ingestion Inhalation Dermal	6.5 0.5 93.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Nickel	97.3	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.87. Summary of Risk Characterization for SWMU 195, EU 17

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.38E-05	Chromium PCB, Total Total PAH Uranium-238	19.7 28.6 38.7 10.6	Ingestion Inhalation Dermal External Exposure	6.0 21.9 60.3 11.7	<1	Nickel	45.0	Ingestion Inhalation Dermal	2.1 0.2 97.7
Outdoor Worker - surface	1.55E-05	Chromium PCB, Total Total PAH Uranium-238	13.0 29.4 42.0 13.6	Ingestion Inhalation Dermal External Exposure	38.1 14.4 39.8 7.7	<1	Nickel	41.6	Ingestion Inhalation Dermal	17.1 0.2 82.7
Outdoor Worker - subsurface	3.47E-05	Arsenic Chromium PCB, Total Total PAH Uranium-238	65.0 4.8 13.1 12.2 4.3	Ingestion Inhalation Dermal External Exposure	63.3 5.5 28.8 2.5	1.10	Arsenic Mercury Nickel	12.8 61.1 12.2	Ingestion Inhalation Dermal	22.5 0.9 76.7

Table D6.87. Summary of Risk Characterization for SWMU 195, EU 17 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	61.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.20E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	12.6 27.6 38.7 4.0 17.1	Ingestion Inhalation Dermal External Exposure	15.7 14.0 50.9 19.4	<1	Nickel Silver	44.7 30.5	Ingestion Inhalation Dermal	3.4 0.1 96.5
Future Child Resident - surface	4.20E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	12.6 27.6 38.7 4.0 17.1	Ingestion Inhalation Dermal External Exposure	15.7 14.0 50.9 19.4	1.34	Mercury Nickel Silver Thallium	14.6 42.6 29.0 10.9	Ingestion Inhalation Dermal	12.6 0.2 87.2
Future Teen Recreational User - surface	6.85E-06	PCB, Total Total PAH	36.2 51.3	Ingestion Inhalation Dermal External Exposure	2.0 8.1 84.9 5.0	<1	Nickel Silver	45.3 30.9	Ingestion Inhalation Dermal	0.6 0.1 99.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.88. Summary of Risk Characterization for SWMU 567, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.11E-06	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Industrial Worker - surface	1.99E-05	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Outdoor Worker - surface	1.48E-05	Cesium-137	100.0	Ingestion	1.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.9					
Outdoor Worker - subsurface	1.48E-05	Cesium-137	100.0	Ingestion	1.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.9					

Table D6.88. Summary of Risk Characterization for SWMU 567, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.00E-04	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Child Resident - surface	1.00E-04	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Teen Recreational User - surface	4.17E-06	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.89. Summary of Risk Characterization for SWMU 487

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs					*no COCs			
Future Industrial Worker - surface	1.60E-05	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Outdoor Worker - surface	1.20E-05	Cesium-137	100.0	Ingestion	1.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.9					
Outdoor Worker - subsurface	1.20E-05	Cesium-137	100.0	Ingestion	1.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.9					

Table D6.89. Summary of Risk Characterization for SWMU 487 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.07E-05	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Child Resident - surface	8.07E-05	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Teen Recreational User - surface	3.36E-06	Cesium-137	100.0	Ingestion	0.1		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.90. Summary of Risk Characterization for SWMU 492

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.96E-05	Chromium PCB, Total Uranium-238	6.5 44.5 42.7	Ingestion Inhalation Dermal External Exposure	9.0 9.9 40.5 40.7	<1	*no COCs			
Future Industrial Worker - surface	5.28E-04	Arsenic Chromium PCB, Total Uranium-234 Uranium-235 Uranium-238	2.8 6.5 44.5 0.5 2.7 42.7	Ingestion Inhalation Dermal External Exposure	9.0 9.9 40.5 40.7	2.13	Beryllium Chromium Uranium	11.4 5.8 77.5	Ingestion Inhalation Dermal	15.1 0.4 84.5
Outdoor Worker - surface	6.92E-04	Arsenic Chromium PCB, Total Uranium-234 Uranium-235 Uranium-238	5.1 3.7 39.3 2.8 1.8 47.2	Ingestion Inhalation Dermal External Exposure	48.6 5.6 22.8 23.0	3.62	Arsenic Beryllium Uranium	6.1 5.4 84.5	Ingestion Inhalation Dermal	63.0 0.2 36.8
Outdoor Worker - subsurface	6.95E-04	Arsenic Cesium-137 Chromium PCB, Total Uranium-234 Uranium-235 Uranium-238	5.1 0.4 3.7 39.1 2.7 1.8 47.0	Ingestion Inhalation Dermal External Exposure	48.4 5.5 22.7 23.3	3.62	Arsenic Beryllium Uranium	6.1 5.4 84.5	Ingestion Inhalation Dermal	63.0 0.2 36.8

Table D6.90. Summary of Risk Characterization for SWMU 492 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	8.69E-06	PCB, Total Uranium-238	39.1 47.0	See Outdoor Worker (subsurface)		1.13	Uranium	84.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.02E-03	Arsenic Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	3.1 3.3 0.1 0.2 34.2 0.6 3.6 54.9	Ingestion Inhalation Dermal External Exposure	14.2 5.0 27.2 53.7	3.97	Arsenic Beryllium Chromium Uranium	4.6 10.4 5.3 78.6	Ingestion Inhalation Dermal	22.7 0.2 77.1
Future Child Resident - surface	2.02E-03	Arsenic Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	3.1 3.3 0.1 0.2 34.2 0.6 3.6 54.9	Ingestion Inhalation Dermal External Exposure	14.2 5.0 27.2 53.7	15.45	Arsenic Beryllium Chromium Uranium Vanadium	5.8 6.5 3.1 83.2 1.0	Ingestion Inhalation Dermal	54.4 0.2 45.4
Future Teen Recreational User - surface	2.10E-04	Arsenic Chromium PCB, Total Uranium-235 Uranium-238	3.9 3.0 70.1 1.4 21.3	Ingestion Inhalation Dermal External Exposure	3.2 4.5 70.9 21.4	2.75	Arsenic Beryllium Chromium Uranium	3.9 12.7 6.5 75.9	Ingestion Inhalation Dermal	4.4 0.1 95.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.91. Summary of Risk Characterization for SWMU 493

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.70E-05	Chromium PCB, Total Total PAH Uranium-238	12.8 8.1 49.5 19.0	Ingestion Inhalation Dermal External Exposure	6.5 14.5 52.7 26.3	1.18	Cobalt Manganese Nickel	30.5 11.7 42.2	Ingestion Inhalation Dermal	7.8 7.8 84.4
Outdoor Worker - surface	1.96E-05	Chromium PCB, Total Total PAH Uranium-238	8.3 8.2 52.5 23.9	Ingestion Inhalation Dermal External Exposure	39.9 9.3 33.9 16.9	1.46	Cobalt Manganese Nickel	45.2 12.4 27.5	Ingestion Inhalation Dermal	44.9 4.7 50.5
Outdoor Worker - subsurface	5.06E-05	Arsenic Cesium-137 Chromium PCB, Total Total PAH Uranium-238	56.2 5.0 3.2 3.2 20.4 9.3	Ingestion Inhalation Dermal External Exposure	59.0 3.6 25.9 11.5	1.68	Arsenic Cobalt Manganese Nickel	10.6 39.2 10.7 23.9	Ingestion Inhalation Dermal	48.8 4.1 47.1

Table D6.91. Summary of Risk Characterization for SWMU 493 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Cobalt Nickel	39.2 23.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.85E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	7.3 6.6 3.9 7.0 44.0 3.6 27.2	Ingestion Inhalation Dermal External Exposure	13.8 8.2 39.4 38.7	2.03	Barium Cobalt Manganese Nickel	5.7 33.1 9.2 41.7	Ingestion Inhalation Dermal	12.7 4.2 83.1
Future Child Resident - surface	5.85E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	7.3 6.6 3.9 7.0 44.0 3.6 27.2	Ingestion Inhalation Dermal External Exposure	13.8 8.2 39.4 38.7	6.68	Aluminum Barium Cobalt Manganese Mercury Nickel Vanadium	4.9 4.3 41.6 12.7 1.8 30.7 2.1	Ingestion Inhalation Dermal	36.0 6.0 58.0
Future Teen Recreational User - surface	7.84E-06	Total PAH	70.9	Ingestion Inhalation Dermal External Exposure	2.2 5.7 80.0 12.0	1.52	Cobalt Manganese Nickel	29.6 6.7 47.1	Ingestion Inhalation Dermal	2.3 2.3 95.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.92. Summary of Risk Characterization for SWMU 517

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.13E-05	Chromium Neptunium-237 PCB, Total Uranium-238	14.4 34.9 23.6 20.2	Ingestion Inhalation Dermal External Exposure	4.4 16.3 20.3 59.0	<1	Nickel	94.6	Ingestion Inhalation Dermal	1.0 0.5 98.5
Outdoor Worker - surface	1.15E-05	Chromium Neptunium-237 PCB, Total Uranium-238	10.5 28.4 26.8 28.8	Ingestion Inhalation Dermal External Exposure	30.4 11.9 14.8 42.9	<1	Nickel	94.7	Ingestion Inhalation Dermal	9.1 0.5 90.4
Outdoor Worker - subsurface	1.15E-05	Chromium Neptunium-237 PCB, Total Uranium-238	10.5 28.4 26.8 28.8	Ingestion Inhalation Dermal External Exposure	30.4 11.9 14.8 42.9	<1	Nickel	74.7	Ingestion Inhalation Dermal	21.0 0.8 78.1

Table D6.92. Summary of Risk Characterization for SWMU 517 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Nickel	74.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.59E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-235 Uranium-238	6.9 4.0 43.1 17.0 4.4 24.5	Ingestion Inhalation Dermal External Exposure	6.2 7.8 12.8 73.2	<1	Nickel	94.6	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	4.59E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-235 Uranium-238	6.9 4.0 43.1 17.0 4.4 24.5	Ingestion Inhalation Dermal External Exposure	6.2 7.8 12.8 73.2	1.75	Nickel	94.6	Ingestion Inhalation Dermal	6.6 0.5 92.9
Future Teen Recreational User - surface	3.41E-06	PCB, Total	49.0	Ingestion Inhalation Dermal External Exposure	2.0 9.9 47.1 41.1	<1	Nickel	94.6	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.93. Summary of Risk Characterization for AOC 541

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.85E-05	Chromium	2.6	Ingestion	9.4	<1	Uranium	95.0	Ingestion	17.0
		PCB, Total	30.9	Inhalation	5.1				Inhalation	0.6
		Total PAH	3.8	Dermal	30.2				Dermal	82.5
		Uranium-235	4.3	External	55.3					
		Uranium-238	56.4	Exposure						
Future Industrial Worker - surface	1.04E-03	Americium-241	0.1	Ingestion	9.4	6.27	Uranium	95.0	Ingestion	17.0
		Cesium-137	1.1	Inhalation	5.1				Inhalation	0.6
		Chromium	2.6	Dermal	30.2				Dermal	82.5
		PCB, Total	30.9	External	55.3					
		Total PAH	3.8	Exposure						
		Uranium-234	0.7							
		Uranium-235	4.3							
		Uranium-238	56.4							
Outdoor Worker - surface	1.40E-03	Americium-241	0.3	Ingestion	50	11.41	Iron	1.0	Ingestion	66.3
		Cesium-137	0.6	Inhalation	2.8		Uranium	96.7	Inhalation	0.2
		Chromium	1.4	Dermal	16.7				Dermal	33.5
		PCB, Total	26.7	External	30.6					
		Total PAH	3.4	Exposure						
		Uranium-234	3.6							
		Uranium-235	2.8							
		Uranium-238	61.1							
Outdoor Worker - subsurface	1.55E-03	Americium-241	0.3	Ingestion	50.2	13.37	Arsenic	1.0	Ingestion	66.3
		Arsenic	1.4	Inhalation	2.7		Iron	1.0	Inhalation	0.3
		Cesium-137	0.5	Dermal	16.2		Uranium	95.6	Dermal	33.4
		Chromium	1.5	External	30.9					
		PCB, Total	24.5	Exposure						
		Total PAH	4.2							
		Uranium-234	3.3							
		Uranium-235	3.2							
		Uranium-238	61.0							

Table D6.93. Summary of Risk Characterization for AOC 541 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.94E-05	PCB, Total	24.5	See Outdoor Worker (subsurface)		4.18	Uranium	95.6	See Outdoor Worker (subsurface) for %	
		Uranium-238	61.0							
		Americium-241	0.2	Ingestion	11.9	11.79	Chromium	1.4	Ingestion	25.3
Future Adult Resident - surface	4.34E-03	Cesium-137	1.3	Inhalation	2.3		Iron	1.0	Inhalation	0.3
		Chromium	1.2	Dermal	18.6		Uranium	95.4	Dermal	74.4
		Cobalt-60	0.1	External	67.1					
		Neptunium-237	0.0	Exposure						
		PCB, Total	21.9							
		Total PAH	2.8							
		Uranium-234	0.7							
		Uranium-235	5.1							
		Uranium-238	66.7							
Future Child Resident - surface	4.34E-03	Arsenic	28.8	Ingestion	11.9	48.08	Aluminum	0.7	Ingestion	57.8
		Cesium-137	21.7	Inhalation	2.3		Chromium	0.8	Inhalation	0.3
		Chromium	0.3	Dermal	18.6		Iron	1.0	Dermal	41.8
		Napthalene	0.2	External	67.1		Nickel	0.3		
		Neptunium-237	0.8	Exposure			Uranium	96.4		
		PCB, Total	13.8				Vanadium	0.2		
		Plutonium-239/240	0.1							
		Thorium-230	0.2							
		Total PAH	10.3							
		Uranium-234	1.3							
		Uranium-235	2.8							
		Uranium-238	19.8							
Future Teen Recreational User - surface	3.64E-04	Arsenic	35.0	Ingestion	3.5	7.94	Chromium	1.8	Ingestion	5.1
		Cesium-137	8.3	Inhalation	2.6		Uranium	94.8	Inhalation	0.2
		PCB, Total	27.0	Dermal	60.5				Dermal	94.7
		Total PAH	20.3	External	33.4					
		Uranium-235	1.1	Exposure						
		Uranium-238	7.3							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.94. Summary of Risk Characterization for SWMU 561, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.73E-06	Uranium-238	61.2	Ingestion	12.4	<1	*no COCs			
				Inhalation	3.5					
				Dermal	22.6					
				External Exposure	61.5					
Future Industrial Worker - surface	1.02E-04	Arsenic	16.2	Ingestion	12.4	<1	Arsenic	14.7	Ingestion	16.2
		Chromium	2.8	Inhalation	3.5		Cobalt	14.3	Inhalation	5.7
		Cobalt-60	3.9	Dermal	22.6		Uranium	34.9	Dermal	78.1
		PCB, Total	5.4	External Exposure	61.5					
		Total PAH	6.5							
		Uranium-235	3.4							
		Uranium-238	61.2							
Outdoor Worker - surface	1.56E-04	Arsenic	25.5	Ingestion	57.5	1.26	Arsenic	19.8	Ingestion	65.1
		Chromium	1.3	Inhalation	1.7		Cobalt	14.8	Inhalation	2.4
		Cobalt-60	1.9	Dermal	11		Iron	12.1	Dermal	32.6
		PCB, Total	4.1	External Exposure	29.8		Uranium	36.5		
		Total PAH	5.2							
		Uranium-234	1.8							
		Uranium-235	1.9							
		Uranium-238	58.1							
Outdoor Worker - subsurface	1.70E-04	Arsenic	23.1	Ingestion	56.1	1.39	Arsenic	17.7	Ingestion	63.8
		Cesium-137	1.3	Inhalation	1.6		Cobalt	13.8	Inhalation	2.6
		Chromium	1.3	Dermal	12.5		Iron	11	Dermal	33.6
		Cobalt-60	1.7	External Exposure	29.8		Uranium	32.8		
		PCB, Total	3.6							
		Total PAH	9.4							
		Uranium-234	1.8							
		Uranium-235	1.8							
		Uranium-238	55.9							

Table D6.94. Summary of Risk Characterization for SWMU 561, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.13E-06	Uranium-238	24.5	See Outdoor Worker (subsurface)		<1	Uranium	32.8	See Outdoor Worker (subsurface) for %	
		Arsenic	15.3	Ingestion	16.7	1.3	Arsenic	15.9	Ingestion	24.8
Future Adult		Chromium	1.2	Inhalation	1.5		Cobalt	14.6	Inhalation	2.9
Resident -	4.60E-04	Cobalt-60	4.4	Dermal	12.9		Iron	11.9	Dermal	72.3
surface		PCB, Total	3.5	External	69.0		Uranium	35.9		
		Total PAH	4.4	Exposure						
		Uranium-234	0.4							
		Uranium-235	3.8							
		Uranium-238	66.9							
Future Child		Arsenic	15.3	Ingestion	16.7	5.33	Antimony	3.2	Ingestion	56.4
Resident -	4.60E-04	Chromium	1.2	Inhalation	1.5		Arsenic	18.9	Inhalation	3.3
surface		Cobalt-60	4.4	Dermal	12.9		Cobalt	14.7	Dermal	40.4
		PCB, Total	3.5	External	69.0		Iron	11.9		
		Total PAH	4.4	Exposure			Manganese	7.2		
		Uranium-234	0.4				Uranium	36.1		
		Uranium-235	3.8				Vanadium	2.5		
		Uranium-238	66.9							
Future Teen Recreational		Arsenic	29.4	Ingestion	5.6	<1	Arsenic	14.1	Ingestion	5.1
User -	3.18E-05	PCB, Total	11.0	Inhalation	2.0		Cobalt	14.7	Inhalation	1.8
surface		Total PAH	13.8	Dermal	50.9		Iron	12.0	Dermal	93.2
		Uranium-238	39.1	External Exposure	41.6		Uranium	36.2		

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.95. Summary of Risk Characterization for SWMU 561, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.31E-05	PCB, Total	21.2	Ingestion	9.9	<1	*no COCs			
		Total PAH	9.9	Inhalation	4.1					
		Uranium-235	4.3	Dermal	29.8					
		Uranium-238	57	External Exposure	56.3					
Future Industrial Worker - surface	4.13E-04	Arsenic	3.2	Ingestion	9.9	1.81	Antimony	11.7	Ingestion	15.6
		Cesium-137	1.1	Inhalation	4.1		Cobalt	6	Inhalation	1.8
		Chromium	2.3	Dermal	29.8		Uranium	71.3	Dermal	82.6
		Cobalt-60	0.4	External	56.3					
		PCB, Total	21.2	Exposure						
		Total PAH	9.9							
		Uranium-234	0.5							
		Uranium-235	4.3							
		Uranium-238	57							
Outdoor Worker - surface	5.66E-04	Arsenic	5.5	Ingestion	51.3	3.14	Antimony	6.3	Ingestion	63.9
		Cesium-137	0.6	Inhalation	2.2		Arsenic	6.2	Inhalation	0.8
		Chromium	1.2	Dermal	16.1		Cobalt	6.3	Dermal	35.3
		Cobalt-60	0.2	External	30.4		Uranium	76.2		
		PCB, Total	17.9	Exposure						
		Total PAH	8.9							
		Uranium-234	2.5							
		Uranium-235	2.8							
		Uranium-238	60.3							
Outdoor Worker - subsurface	5.51E-04	Arsenic	5.5	Ingestion	51.2	3.19	Antimony	5.9	Ingestion	64
		Cesium-137	0.6	Inhalation	2.3		Arsenic	6.0	Inhalation	0.8
		Chromium	1.4	Dermal	16.4		Cobalt	5.9	Dermal	35.2
		Cobalt-60	0.2	External	30.1		Uranium	76.0		
		PCB, Total	18.7	Exposure						
		Total PAH	8.6							
		Uranium-234	2.5							
		Uranium-235	2.7							
		Uranium-238	59.7							

Table D6.95. Summary of Risk Characterization for SWMU 561, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	6.89E-06	PCB, Total	18.7	See Outdoor Worker (subsurface)		<1	Uranium	76	See Outdoor Worker (subsurface) for %	
		Uranium-238	59.7							
Future Adult Resident - surface	1.74E-03	Arsenic	3.2	Ingestion	12.9	3.36	Antimony	10.9	Ingestion	23.5
		Cesium-137	1.4	Inhalation	1.8		Arsenic	4.8	Inhalation	0.9
		Chromium	1.1	Dermal	18.1		Cobalt	6	Dermal	75.6
		Cobalt-60	0.5	External	67.2		Uranium	72.5		
		PCB, Total	14.7	Exposure						
		Total PAH	7.2							
		Uranium-234	0.5							
		Uranium-235	5.2							
		Uranium-238	66.3							
Future Child Resident - surface	1.74E-03	Arsenic	3.2	Ingestion	12.9	13.34	Antimony	7.2	Ingestion	55.3
		Chromium	1.4	Inhalation	1.8		Arsenic	5.9	Inhalation	1.1
		Cobalt-60	1.1	Dermal	18.1		Chromium	1.0	Dermal	43.6
		PCB, Total	0.5	External	67.2		Cobalt	6.3		
		Total PAH	14.7	Exposure			Manganese	2		
		Uranium-234	7.2				Thallium	0.8		
		Uranium-235	0.5				Uranium	75.3		
		Uranium-238	5.2				Vanadium	0.9		
			66.3							
Future Teen Recreational User - surface	1.43E-04	Arsenic	5.1	Ingestion	3.8	2.3	Antimony	13.1	Ingestion	4.7
		Chromium	1.2	Inhalation	2.1		Cobalt	5.9	Inhalation	0.5
		PCB, Total	38.4	Dermal	60		Uranium	71.0	Dermal	94.8
		Total PAH	18.9	External	34.1					
		Uranium-235	2.6	Exposure						
		Uranium-238	32.7							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.96. Summary of Risk Characterization for SWMU 562, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.61E-06	Uranium-238	100.0	Ingestion Inhalation Dermal External Exposure	11.2 0.3 88.5	<1	*no COCs			
Outdoor Worker - surface	2.33E-06	Uranium-238	100.0	Ingestion Inhalation Dermal External Exposure	54.7 0.2 45.2	<1	Uranium	100.0	Ingestion Inhalation Dermal	67.0 0.2 32.8
Outdoor Worker - subsurface	9.15E-05	Arsenic Cesium-137 Chromium PCB, Total Uranium-235 Uranium-238	31.1 4.3 8.4 13.6 1.4 41.2	Ingestion Inhalation Dermal External Exposure	52.3 9.1 14.5 24.0	<1	Arsenic Uranium	29.7 65.6	Ingestion Inhalation Dermal	67.0 0.2 32.8

Table D6.96. Summary of Risk Characterization for SWMU 562, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.14E-06			See Outdoor Worker (subsurface)		<1	Uranium	65.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.89E-06	Uranium-238	100.0	Ingestion	9.2	<1	Uranium	100.0	Ingestion	25.9
				Inhalation	0.1				Inhalation	0.2
				Dermal					Dermal	73.9
				External Exposure	90.8					
Future Child Resident - surface	7.89E-06	Uranium-238	100.0	Ingestion	9.2	<1	Uranium	100.0	Ingestion	58.7
				Inhalation	0.1				Inhalation	0.2
				Dermal					Dermal	41.1
				External Exposure	90.8					
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	Uranium	100.0	Ingestion	5.3
									Inhalation	0.1
									Dermal	94.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.97. Summary of Risk Characterization for SWMU 562, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.10E-05	Uranium-235 Uranium-238	6.0 91.0	Ingestion Inhalation Dermal External Exposure	11.1 0.5 1.9 86.5	<1	*no COCs			
Future Industrial Worker - surface	3.76E-04	PCB, Total Uranium-234 Uranium-235 Uranium-238	2.2 0.8 6.0 91.0	Ingestion Inhalation Dermal External Exposure	11.1 0.5 1.9 86.5	<1	*no COCs			
Outdoor Worker - surface	5.44E-04	PCB, Total Uranium-234 Uranium-235 Uranium-238	1.8 3.5 3.6 91.1	Ingestion Inhalation Dermal External Exposure	54.6 0.2 1.0 44.2	<1	*no COCs			
Outdoor Worker - subsurface	5.47E-04	Cesium-137 PCB, Total Uranium-234 Uranium-235 Uranium-238	0.6 1.8 3.4 3.6 90.6	Ingestion Inhalation Dermal External Exposure	54.3 0.2 1.0 44.5	<1	*no COCs			

Table D6.97. Summary of Risk Characterization for SWMU 562, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	6.84E-06	Uranium-238	90.6	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.83E-03	PCB, Total Uranium-234 Uranium-235 Uranium-238	1.4 0.6 6.2 91.8	Ingestion Inhalation Dermal External Exposure	9.4 0.1 1.0 89.5	<1	*no COCs			
Future Child Resident - surface	1.83E-03	PCB, Total Uranium-234 Uranium-235 Uranium-238	1.4 0.6 6.2 91.8	Ingestion Inhalation Dermal External Exposure	9.4 0.1 1.0 89.5	<1	*no COCs			
Future Teen Recreational User - surface	7.82E-05	PCB, Total Uranium-235 Uranium-238	6.8 6.0 86.8	Ingestion Inhalation Dermal External Exposure	6.0 0.3 6.5 87.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.98. Summary of Risk Characterization for SWMU 562, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.31E-05	Chromium PCB, Total Total PAH Uranium-238	9.7 9.8 28.4 49.0	Ingestion Inhalation Dermal External Exposure	8.3 10.6 34.7 46.5	<1	*no COCs			
Outdoor Worker - surface	1.66E-05	PCB, Total Total PAH Uranium-238	8.9 27.3 56.0	Ingestion Inhalation Dermal External Exposure	46.6 6.2 20.2 27.1	<1	Uranium	96.8	Ingestion Inhalation Dermal	64.9 0.2 34.9
Outdoor Worker - subsurface	1.57E-05	PCB, Total Total PAH Uranium-238	9.4 28.9 59.3	Ingestion Inhalation Dermal External Exposure	49.3 0.6 21.4 28.7	<1	Uranium	100.0	Ingestion Inhalation Dermal	67.0 0.2 32.8

Table D6.98. Summary of Risk Characterization for SWMU 562, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.11E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	4.8 7.4 22.1 4.1 61.6	Ingestion Inhalation Dermal External Exposure	12.1 5.2 22.7 59.9	<1	Uranium	93.1	Ingestion Inhalation Dermal	24.2 0.2 75.6
Future Child Resident - surface	5.11E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	4.8 7.4 22.1 4.1 61.6	Ingestion Inhalation Dermal External Exposure	12.1 5.2 22.7 59.9	<1	Uranium	96.0	Ingestion Inhalation Dermal	56.4 0.2 43.4
Future Teen Recreational User - surface	4.84E-06	Total PAH Uranium-238	50.6 26.3	Ingestion Inhalation Dermal External Exposure	3.0 5.2 65.4 26.4	<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.99. Summary of Risk Characterization for SWMU 562, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.86E-06	Chromium Uranium-238	54.0 46.0	Ingestion Inhalation Dermal External Exposure	5.1 54.1 40.7	<1	*no COCs			
Outdoor Worker - surface	3.05E-06	Chromium Uranium-238	37.5 62.5	Ingestion Inhalation Dermal External Exposure	34.2 37.6 28.2	<1	*no COCs			
Outdoor Worker - subsurface	7.47E-06	Cesium-137 Chromium Uranium-238	57.0 15.3 27.6	Ingestion Inhalation Dermal External Exposure	15.7 15.4 68.9	<1	*no COCs			

Table D6.99. Summary of Risk Characterization for SWMU 562, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.48E-06	Chromium Uranium-238	31.7 68.3	Ingestion Inhalation Dermal External Exposure	6.3 31.7 62.0	<1	*no COCs			
Future Child Resident - surface	9.48E-06	Chromium Uranium-238	31.7 68.3	Ingestion Inhalation Dermal External Exposure	6.3 31.7 62.0	<1	Uranium	87.5	Ingestion Inhalation Dermal	51.6 0.2 48.2
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.100. Summary of Risk Characterization for SWMU 562, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.85E-06	Uranium-238	72.1	Ingestion	9.8	<1	*no COCs			
				Inhalation	11.0					
				Dermal	10.7					
				External Exposure	68.5					
Future Industrial Worker - surface	5.09E-05	Chromium	10.0	Ingestion	9.8	<1	Uranium	91.5	Ingestion	16.0
		PCB, Total	9.9	Inhalation	11.0				Inhalation	0.4
		Total PAH	2.3	Dermal	10.7				Dermal	83.6
		Uranium-235	4.7	External Exposure	68.5					
		Uranium-238	72.1							
Outdoor Worker - surface	6.94E-05	Chromium	5.4	Ingestion	51.1	<1	Uranium	96.3	Ingestion	64.7
		PCB, Total	8.4	Inhalation	5.9				Inhalation	0.2
		Total PAH	2.1	Dermal	5.8				Dermal	35.2
		Uranium-234	4.4	External Exposure	37.2					
		Uranium-235	3.0							
		Uranium-238	76.7							
Outdoor Worker - subsurface	7.27E-05	Cesium-137	4.5	Ingestion	48.8	<1	Uranium	96.3	Ingestion	64.7
		Chromium	5.2	Inhalation	5.7				Inhalation	0.2
		PCB, Total	8.1	Dermal	5.6				Dermal	35.2
		Total PAH	2.0	External Exposure	40.0					
		Uranium-234	4.2							
		Uranium-235	2.9							
		Uranium-238	73.2							

Table D6.100. Summary of Risk Characterization for SWMU 562, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Uranium	96.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.23E-04	Chromium	4.4	Ingestion	10.0	<1	Uranium	92.2	Ingestion	23.9
		PCB, Total	6.7	Inhalation	4.8				Inhalation	0.2
		Total PAH	1.6	Dermal	6.3				Dermal	75.9
		Uranium-234	0.8	External Exposure	78.9					
		Uranium-235	5.4							
		Uranium-238	81.0							
Future Child Resident - surface	2.23E-04	Chromium	4.4	Ingestion	10.0	1.58	Uranium	95.5	Ingestion	56.1
		PCB, Total	6.7	Inhalation	4.8				Inhalation	0.2
		Total PAH	1.6	Dermal	6.3				Dermal	43.7
		Uranium-234	0.8	External Exposure	78.9					
		Uranium-235	5.4							
		Uranium-238	81.0							
Future Teen Recreational User - surface	1.27E-05	PCB, Total	25.0	Ingestion	4.6	<1	Uranium	90.3	Ingestion	4.8
		Uranium-238	57.3	Inhalation	7.9				Inhalation	0.1
				Dermal	30.0				Dermal	95.1
				External Exposure	57.5					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.101. Summary of Risk Characterization for SWMU 562, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.30E-05	Uranium-238	91.7	Ingestion	11.2		*no COCs			
				Inhalation	0.3					
				Dermal						
				External Exposure	88.4					
Future Industrial Worker - surface	2.32E-04	Uranium-234	0.9	Ingestion	11.2		*no COCs			
		Uranium-235	7.4	Inhalation	0.3					
		Uranium-238	91.7	Dermal						
				External Exposure	88.4					
Outdoor Worker - surface	3.38E-04	Uranium-234	4.2	Ingestion	54.8		*no COCs			
		Uranium-235	4.4	Inhalation	0.2					
		Uranium-238	91.4	Dermal						
				External Exposure	45.0					
Outdoor Worker - subsurface	3.38E-04	Uranium-234	4.2	Ingestion	54.8		*no COCs			
		Uranium-235	4.4	Inhalation	0.2					
		Uranium-238	91.4	Dermal						
				External Exposure	45.0					

Table D6.101. Summary of Risk Characterization for SWMU 562, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	4.22E-06	Uranium-238	91.4	See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.14E-03	Uranium-234 Uranium-235 Uranium-238	0.7 7.6 91.7	Ingestion Inhalation Dermal External Exposure	9.2 0.1 90.7		*no COCs			
Future Child Resident - surface	1.14E-03	Uranium-234 Uranium-235 Uranium-238	0.7 7.6 91.7	Ingestion Inhalation Dermal External Exposure	9.2 0.1 90.7		*no COCs			
Future Teen Recreational User - surface	4.61E-05	Uranium-235 Uranium-238	7.8 91.7	Ingestion Inhalation Dermal External Exposure	6.3 0.2 93.5		*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.102. Summary of Risk Characterization for SWMU 563, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.50E-05	Chromium PCB, Total Uranium-238	62.9 26.3 10.8	Ingestion Inhalation Dermal External Exposure	2.9 64.8 22.7 9.6	<1	*no COCs			
Outdoor Worker - surface	1.39E-05	Chromium PCB, Total Uranium-238	50.3 32.8 16.9	Ingestion Inhalation Dermal External Exposure	22.5 51.8 18.1 7.6	<1	*no COCs			
Outdoor Worker - subsurface	3.54E-05	Cesium-137 Chromium PCB, Total Uranium-238	7.1 23.1 61.7 7.1	Ingestion Inhalation Dermal External Exposure	28.9 26.0 34.0 11.1	<1	*no COCs			

Table D6.102. Summary of Risk Characterization for SWMU 563, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.79E-05	Chromium PCB, Total Uranium-238	48.4 30.6 21.0	Ingestion Inhalation Dermal External Exposure	8.0 49.8 23.0 19.1	<1	*no COCs			
Future Child Resident - surface	3.79E-05	Chromium PCB, Total Uranium-238	48.4 30.6 21.0	Ingestion Inhalation Dermal External Exposure	8.0 49.8 23.0 19.1	<1	Chromium Uranium	51.0 42.0	Ingestion Inhalation Dermal	29.9 0.3 69.8
Future Teen Recreational User - surface	4.52E-06	Chromium PCB, Total	38.1 54.8	Ingestion Inhalation Dermal External Exposure	1.5 39.3 52.6 6.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.103. Summary of Risk Characterization for SWMU 563, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs					*no COCs			
Future Industrial Worker - surface	8.39E-06	Cesium-137	89.6	Ingestion	1.3		*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.7					
Outdoor Worker - surface	6.89E-06	Cesium-137	81.5	Ingestion	11.0		*no COCs			
		Uranium-238	18.5	Inhalation	0.0					
				Dermal						
				External Exposure	89.0					
Outdoor Worker - subsurface	6.89E-06	Cesium-137	81.5	Ingestion	11.0		*no COCs			
		Uranium-238	18.5	Inhalation	0.0					
				Dermal						
				External Exposure	89.0					

Table D6.103. Summary of Risk Characterization for SWMU 563, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.22E-05	Cesium-137 Uranium-238	89.8 10.2	Ingestion Inhalation Dermal External Exposure	1.0 0.0 99.0		*no COCs			
Future Child Resident - surface	4.22E-05	Cesium-137 Uranium-238	89.8 10.2	Ingestion Inhalation Dermal External Exposure	1.0 0.0 99.0		*no COCs			
Future Teen Recreational User - surface	1.75E-06	Cesium-137	90.1	Ingestion Inhalation Dermal External Exposure	0.7 0.0 99.3		*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.104. Summary of Risk Characterization for SWMU 564

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.90E-06	Arsenic	61.9	Ingestion	18.9	<1	*no COCs			
				Inhalation	4.8					
				Dermal	58.3					
				External Exposure	18.0					
Future Industrial Worker - surface	6.97E-05	Arsenic	61.9	Ingestion	18.9	<1	Arsenic	37.6	Ingestion	18.0
		Cesium-137	10.3	Inhalation	4.8		Iron	20.2	Inhalation	0.6
		Chromium	3.6	Dermal	58.3				Dermal	81.4
		PCB, Total	14.8	External Exposure	18.0					
		Uranium-238	7.0							
Outdoor Worker - surface	1.35E-04	Arsenic	76.5	Ingestion	69.1	1.36	Arsenic	47.5	Ingestion	67.8
		Cesium-137	4.0	Inhalation	1.8		Iron	19.9	Inhalation	0.2
		Chromium	1.4	Dermal	22.2		Thallium	11.2	Dermal	32.0
		PCB, Total	8.8	External Exposure	6.8		Uranium	7.4		
		Thorium-230	1.7							
		Uranium-234	1.8							
		Uranium-238	5.2							
Outdoor Worker - subsurface	1.36E-04	Arsenic	76.3	Ingestion	69.0	1.43	Arsenic	45.2	Ingestion	67.7
		Cesium-137	4.0	Inhalation	2.0		Iron	18.9	Inhalation	0.4
		Chromium	1.5	Dermal	22.2		Thallium	10.7	Dermal	32.0
		PCB, Total	8.8	External Exposure	6.9		Uranium	7.0		
		Thorium-230	1.7							
		Uranium-234	1.8							
		Uranium-238	5.4							

Table D6.104. Summary of Risk Characterization for SWMU 564 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.70E-06	Arsenic	76.3	See Outdoor Worker (subsurface)		<1	Arsenic	45.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.86E-04	Arsenic Cesium-137 Chromium PCB, Total Thorium-230 Uranium-234 Uranium-235 Uranium-238	63.9 12.7 1.7 10.6 0.5 0.5 1.7 8.4	Ingestion Inhalation Dermal External Exposure	39.2 2.3 36.5 22.1	1.37	Arsenic Iron Thallium Uranium	39.2 20.2 11.4 7.5	Ingestion Inhalation Dermal	26.7 0.3 73.1
Future Child Resident - surface	2.86E-04	Arsenic Cesium-137 Chromium PCB, Total Thorium-230 Uranium-234 Uranium-235 Uranium-238	63.9 12.7 1.7 10.6 0.5 0.5 1.7 8.4	Ingestion Inhalation Dermal External Exposure	39.2 2.3 36.5 22.1	5.70	Arsenic Beryllium Iron Mercury Nickel Thallium Uranium Vanadium	45.9 3.6 19.9 1.9 3.8 11.2 7.4 4.9	Ingestion Inhalation Dermal	59.6 0.3 40.1
Future Teen Recreational User - surface	3.39E-05	Arsenic Cesium-137 PCB, Total	71.5 4.5 19.0	Ingestion Inhalation Dermal External Exposure	6.8 1.8 83.6 7.7	<1	Arsenic Iron Thallium	34.8 20.4 11.5	Ingestion Inhalation Dermal	5.4 0.2 94.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.105. Summary of Risk Characterization for SWMU 567, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface	<1E-6					<1	*no COCs			

Table D6.105. Summary of Risk Characterization for SWMU 567, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.106. Summary of Risk Characterization for SWMU 567, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface							*no COCs			

Table D6.106. Summary of Risk Characterization for SWMU 567, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface				See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.107. Summary of Risk Characterization for SWMU 567, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.26E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.74E-06	Chromium Uranium-238	46.6 53.4	Ingestion Inhalation Dermal External Exposure	29.2 46.6 24.1	<1	*no COCs			

Table D6.107. Summary of Risk Characterization for SWMU 567, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.44E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.44E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.108. Summary of Risk Characterization for SWMU 567, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.16E-06	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.29E-06	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.72E-05	Arsenic	96.6	Ingestion Inhalation Dermal External Exposure	76.5 0.1 21.9 1.5	<1	Arsenic	71.0	Ingestion Inhalation Dermal	73.6 1.1 25.3

Table D6.108. Summary of Risk Characterization for SWMU 567, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.08E-06	Chromium Uranium-238	25.7 74.3	Ingestion Inhalation Dermal External Exposure	6.8 25.7 67.5	<1	*no COCs			
Future Child Resident - surface	4.08E-06	Chromium Uranium-238	25.7 74.3	Ingestion Inhalation Dermal External Exposure	6.8 25.7 67.5	<1	Aluminum	97.4	Ingestion Inhalation Dermal	54.9 4.1 41.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.109. Summary of Risk Characterization for SWMU 14, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.06E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.90E-05	Arsenic Chromium PCB, Total Technetium-99	58.1 11.1 14.1 5.9	Ingestion Inhalation Dermal External Exposure	22.3 12.4 54.9 10.4	<1	Nickel Silver	46.6 22.1	Ingestion Inhalation Dermal	6.8 0.4 92.8
Outdoor Worker - surface	4.10E-05	Arsenic Chromium PCB, Total Technetium-99 Uranium-238	64.6 3.8 7.5 17.1 3.5	Ingestion Inhalation Dermal External Exposure	73.4 4.2 18.8 3.6	<1	Arsenic Iron Nickel Silver Uranium	20.1 16.9 32.0 15.2 15.1	Ingestion Inhalation Dermal	41.3 0.3 58.4
Outdoor Worker - subsurface	4.71E-05	Arsenic Chromium Cobalt-60 PCB, Total Technetium-99 Uranium-238	57.6 3.4 2.2 6.6 14.9 11.3	Ingestion Inhalation Dermal External Exposure	69.4 3.9 16.7 10.0	2.56	Arsenic Iron Nickel Silver Uranium	6.6 12.3 54.5 4.9 17.3	Ingestion Inhalation Dermal	32.3 0.9 66.8

Table D6.109. Summary of Risk Characterization for SWMU 14, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Nickel Uranium	54.5 17.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.33E-05	Americium-241 Arsenic Chromium Neptunium-237 PCB, Total Technetium-99 Uranium-238	1.6 63.6 5.6 5.4 10.7 6.4 6.7	Ingestion Inhalation Dermal External Exposure	43.8 6.2 36.4 13.5	1.24	Arsenic Iron Nickel Silver Uranium	11.0 11.5 44.9 21.4 10.2	Ingestion Inhalation Dermal	10.8 0.2 89.0
Future Child Resident - surface	7.33E-05	Americium-241 Arsenic Chromium Neptunium-237 PCB, Total Technetium-99 Uranium-238	1.6 63.6 5.6 5.4 10.7 6.4 6.7	Ingestion Inhalation Dermal External Exposure	43.8 6.2 36.4 13.5	3.79	Arsenic Iron Nickel Silver Uranium	17.6 15.4 35.5 16.9 13.8	Ingestion Inhalation Dermal	33.0 0.3 66.7
Future Teen Recreational User - surface	8.80E-06	Arsenic PCB, Total	70.4 19.0	Ingestion Inhalation Dermal External Exposure	7.8 4.8 82.6 4.7	<1	Nickel Silver	48.6 23.2	Ingestion Inhalation Dermal	1.9 0.1 98.0

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.110. Summary of Risk Characterization for SWMU 14, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.79E-06	Uranium-238	48.7	Ingestion	15	<1	*no COCs			
				Inhalation	4					
				Dermal	26.3					
				External Exposure	54.7					
Future Industrial Worker - surface	6.77E-05	Arsenic	21.5	Ingestion	15	2.37	Antimony	6.2	Ingestion	5.3
		Chromium	3.3	Inhalation	4		Iron	6.3	Inhalation	1.8
		Neptunium-237	4.2	Dermal	26.3		Nickel	66.9	Dermal	92.9
		PCB, Total	3.1	External	54.7		Uranium	11.6		
		Total PAH	8.4	Exposure						
		Uranium-234	2.5							
		Uranium-235	7.5							
		Uranium-238	48.7							
Outdoor Worker - surface	1.15E-04	Arsenic	30.5	Ingestion	62.9	2.56	Antimony	5.4	Ingestion	35.2
		Chromium	1.4	Inhalation	1.7		Arsenic	8.6	Inhalation	1.2
		Neptunium-237	2.0	Dermal	11.5		Iron	10.8	Dermal	63.6
		PCB, Total	2.1	External	23.9		Nickel	50.0		
		Thorium-230	2.4	Exposure			Uranium	19.8		
		Total PAH	6.1							
		Uranium-234	10.0							
		Uranium-235	3.8							
		Uranium-238	41.7							
Outdoor Worker - subsurface	1.83E-04	Arsenic	19.4	Ingestion	58	3.19	Antimony	3.3	Ingestion	30.3
		Chromium	1.0	Inhalation	1.9		Arsenic	5.5	Inhalation	0.9
		Neptunium-237	2.8	Dermal	15.2		Iron	8.1	Dermal	68.8
		PCB, Total	16.9	External	24.9		Mercury	20.6		
		Thorium-230	1.9	Exposure			Nickel	39.7		
		Total PAH	2.6				Uranium	15.8		
		Uranium-234	9.3							
		Uranium-235	4.1							
		Uranium-238	41.9							

Table D6.110. Summary of Risk Characterization for SWMU 14, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.28E-06			See Outdoor Worker (subsurface)		1.25	Iron	8.1	See Outdoor Worker (subsurface) for %	
							Mercury	20.6		
							Nickel	39.7		
							Uranium	15.8		
Future Adult Resident - surface	3.00E-04	Arsenic	20.6	Ingestion	20.9	4.12	Antimony	6.1	Ingestion	8.6
		Chromium	1.4	Inhalation	1.7		Arsenic	4.4	Inhalation	1.0
		Neptunium-237	4.8	Dermal	15.2		Iron	72.5	Dermal	90.5
		PCB, Total	2.0	External	62.2		Nickel	65.5		
		Thorium-230	0.6	Exposure			Uranium	12.5		
		Total PAH	5.8							
		Uranium-234	2.2							
		Uranium-235	8.5							
		Uranium-238	54.1							
Future Child Resident - surface	3.00E-04	Arsenic	20.6	Ingestion	20.9	12.04	Antimony	5.6	Ingestion	27.4
		Chromium	1.4	Inhalation	1.7		Arsenic	7.3	Inhalation	1.5
		Neptunium-237	4.8	Dermal	15.2		Iron	9.6	Dermal	71.0
		PCB, Total	2.0	External	62.2		Manganese	2.9		
		Thorium-230	0.6	Exposure			Mercury	1.0		
		Total PAH	5.8				Nickel	54.3		
		Uranium-234	2.2				Uranium	17.7		
		Uranium-235	8.5							
		Uranium-238	54.1							
Future Teen Recreational User - surface	2.21E-05	Arsenic	37.0	Ingestion	6.5	3.26	Antimony	6.4	Ingestion	1.5
		PCB, Total	5.9	Inhalation	2.1		Arsenic	3.3	Inhalation	0.5
		Total PAH	17.0	Dermal	56.2		Iron	5.8	Dermal	98.0
		Uranium-235	4.8	External	35.1		Nickel	69.8		
		Uranium-238	29.6	Exposure			Uranium	10.6		

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.111. Summary of Risk Characterization for SWMU 14, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.49E-06	PCB, Total	73.9	Ingestion	10.5	<1	*no COCs			
				Inhalation	9.1					
				Dermal	79.2					
				External Exposure	1.3					
Future Industrial Worker - surface	6.23E-05	Arsenic	20.9	Ingestion	10.5	2.67	Iron	5.2	Ingestion	4.3
		Chromium	3.7	Inhalation	9.1		Mercury	31.1	Inhalation	1.2
		PCB, Total	73.9	Dermal	79.2		Nickel	50.4	Dermal	94.5
				External Exposure	1.3		Uranium	7.6		
Outdoor Worker - surface	8.76E-05	Arsenic	35.7	Ingestion	52.9	2.71	Arsenic	7.2	Ingestion	30.1
		Chromium	2.0	Inhalation	4.8		Iron	9.5	Inhalation	0.9
		PCB, Total	60.9	Dermal	41.7		Mercury	25.6	Dermal	69.0
		Uranium-238	1.5	External Exposure	0.7		Nickel	40.1		
							Uranium	13.9		
Outdoor Worker - subsurface	1.13E-04	Arsenic	40.5	Ingestion	56.3	3.54	Arsenic	8.1	Ingestion	34.2
		Chromium	1.5	Inhalation	3.8		Cobalt	8.0	Inhalation	0.9
		PCB, Total	47.5	Dermal	35.4		Iron	9.7	Dermal	65.0
		Uranium-234	1.4	External Exposure	4.4		Mercury	19.6		
		Uranium-238	8.1				Nickel	35.4		
							Silver	2.8		
							Uranium	10.7		

Table D6.111. Summary of Risk Characterization for SWMU 14, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.42E-06			See Outdoor Worker (subsurface)		1.11	Iron Mercury Nickel Uranium	9.7 19.6 35.4 10.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.99E-04	Arsenic Chromium PCB, Total Uranium-238	27.6 2.3 67.9 2.2	Ingestion Inhalation Dermal External Exposure	29.0 5.6 63.4 2.0	4.64	Arsenic Iron Mercury Nickel Uranium	3.5 5.7 30.7 49.5 8.3	Ingestion Inhalation Dermal	6.9 0.6 92.4
Future Child Resident - surface	1.99E-04	Arsenic Chromium PCB, Total Uranium-238	27.6 2.3 67.9 2.2	Ingestion Inhalation Dermal External Exposure	29.0 5.6 63.4 2.0	12.97	Arsenic Iron Manganese Mercury Nickel Uranium	6.1 8.3 1.9 27.0 42.9 12.2	Ingestion Inhalation Dermal	23.1 1.1 75.8
Future Teen Recreational User - surface	3.68E-05	Arsenic PCB, Total	19.9 78.5	Ingestion Inhalation Dermal External Exposure	3.2 2.8 93.5 0.4	3.73	Iron Mercury Nickel Uranium	4.7 32.1 51.9 6.9	Ingestion Inhalation Dermal	1.2 0.3 98.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.112. Summary of Risk Characterization for SWMU 14, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.07E-05	PCB, Total	18.4	Ingestion	12.5	<1	*no COCs			
		Uranium-235	10.6	Inhalation	3.0					
		Uranium-238	51.9	Dermal	23.1					
				External Exposure	61.5					
Future Industrial Worker - surface	1.91E-04	Arsenic	7.0	Ingestion	12.5	2.66	Antimony	6.4	Ingestion	5.2
		Chromium	1.2	Inhalation	3.0		Iron	5.8	Inhalation	0.4
		Neptunium-237	5.2	Dermal	23.1		Nickel	64.2	Dermal	94.4
		PCB, Total	18.4	External	61.5		Silver	4.1		
		Total PAH	2.2	Exposure			Uranium	13.1		
		Uranium-234	3.1							
		Uranium-235	10.6							
		Uranium-238	51.9							
Outdoor Worker - surface	2.93E-04	Arsenic	10.9	Ingestion	57.8	2.85	Antimony	5.6	Ingestion	34.6
		Chromium	0.6	Inhalation	1.4		Arsenic	7.0	Inhalation	0.3
		Neptunium-237	2.8	Dermal	11.1		Iron	10.1	Dermal	65.1
		PCB, Total	13.9	External	29.7		Nickel	48.3		
		Thorium-230	1.3	Exposure			Uranium	22.5		
		Total PAH	1.8							
		Uranium-234	13.6							
		Uranium-235	6.0							
		Uranium-238	49.1							
Outdoor Worker - subsurface	2.49E-04	Arsenic	12.1	Ingestion	56.7	3.86	Antimony	3.2	Ingestion	33.4
		Chromium	0.6	Inhalation	1.7		Arsenic	4.8	Inhalation	0.7
		Neptunium-237	2.5	Dermal	15.0		Cobalt	6.6	Dermal	65.9
		PCB, Total	20.6	External	26.7		Iron	7.4		
		Thorium-230	1.0	Exposure			Mercury	19.2		
		Total PAH	1.6				Nickel	35.6		
		Uranium-234	12.2				Uranium	16.6		
		Uranium-235	5.4							
		Uranium-238	44.1							

Table D6.112. Summary of Risk Characterization for SWMU 14, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	3.11E-06	Uranium-238	44.1	See Outdoor Worker (subsurface)		1.21	Mercury Nickel Uranium	19.2 35.6 16.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.43E-04	Arsenic Chromium Neptunium-237 PCB, Total Thorium-230 Total PAH Uranium-234 Uranium-235 Uranium-238	6.7 0.5 5.9 12.3 0.3 1.5 2.8 12.1 57.9	Ingestion Inhalation Dermal External Exposure	15.0 1.2 13.4 70.4	4.66	Antimony Arsenic Iron Nickel Silver Uranium	6.3 3.5 6.3 62.5 4.0 14.1	Ingestion Inhalation Dermal	8.3 0.2 91.4
Future Child Resident - surface	8.43E-04	Arsenic Chromium Neptunium-237 PCB, Total Thorium-230 Total PAH Uranium-234 Uranium-235 Uranium-238	6.7 0.5 5.9 12.3 0.3 1.5 2.8 12.1 57.9	Ingestion Inhalation Dermal External Exposure	15.0 1.2 13.4 70.4	13.44	Antimony Arsenic Copper Iron Mercury Nickel Silver Uranium	5.8 6.0 1.4 9.0 1.7 52.4 3.3 20.1	Ingestion Inhalation Dermal	27.0 0.4 72.6
Future Teen Recreational User - surface	5.96E-05	Arsenic Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	12.6 3.5 37.1 4.7 7.1 33.1	Ingestion Inhalation Dermal External Exposure	5.2 1.7 51.7 41.5	3.71	Antimony Iron Nickel Silver Uranium	6.5 5.3 66.2 4.2 11.8	Ingestion Inhalation Dermal	1.4 0.1 98.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.113. Summary of Risk Characterization for SWMU 14, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.40E-06	Uranium-238	57.4	Ingestion	14.6	<1	*no COCs			
				Inhalation	2.5					
				Dermal	16.7					
				External Exposure	66.1					
Future Industrial Worker - surface	9.64E-05	Arsenic	13.6	Ingestion	14.6	3.19	Cobalt	4.2	Ingestion	4.9
		Chromium	1.6	Inhalation	2.5		Iron	4.9	Inhalation	0.9
		Neptunium-237	6.7	Dermal	16.7		Mercury	38.1	Dermal	94.2
		PCB, Total	5.5	External	66.1		Nickel	33.8		
		Thorium-230	1.0	Exposure			Silver	3.7		
		Total PAH	2.1				Uranium	7.7		
		Uranium-234	2.9							
		Uranium-235	8.7							
		Uranium-238	57.4							
Outdoor Worker - surface	1.61E-04	Arsenic	19.6	Ingestion	62.1	3.36	Arsenic	5.9	Ingestion	33.1
		Chromium	0.7	Inhalation	1.1		Cobalt	7.3	Inhalation	0.6
		Neptunium-237	3.3	Dermal	7.4		Iron	8.6	Dermal	66.3
		PCB, Total	3.8	External	29.3		Mercury	30.2		
		Technetium-99	1.1	Exposure			Nickel	25.9		
		Thorium-230	3.9				Uranium	13.5		
		Total PAH	1.5							
		Uranium-234	11.5							
		Uranium-235	4.5							
		Uranium-238	49.9							
Outdoor Worker - subsurface	1.74E-04	Arsenic	17.5	Ingestion	56.9	3.33	Arsenic	5.7	Ingestion	32.9
		Chromium	0.7	Inhalation	2.1		Cobalt	5.8	Inhalation	0.7
		Neptunium-237	3.0	Dermal	19.5		Iron	8.7	Dermal	66.4
		PCB, Total	27.0	External	21.5		Mercury	30.5		
		Technetium-99	0.8	Exposure			Nickel	26.2		
		Thorium-230	2.8				Uranium	13.6		
		Total PAH	1.1							
		Uranium-234	8.2							
		Uranium-235	3.2							
		Uranium-238	35.5							

Table D6.113. Summary of Risk Characterization for SWMU 14, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.18E-06			See Outdoor Worker (subsurface)		1.04	Mercury	30.5	See Outdoor Worker (subsurface) for %	
							Nickel	26.2		
							Uranium	13.6		
Future Adult Resident - surface	4.43E-04	Arsenic	12.5	Ingestion	17.2	5.57	Antimony	2.8	Ingestion	7.9
		Chromium	0.7	Inhalation	1.0		Arsenic	2.9	Inhalation	0.5
		Neptunium-237	7.3	Dermal	9.3		Cobalt	4.5	Dermal	91.6
		PCB, Total	3.5	External	72.5		Iron	5.3		
		Technetium-99	0.3	Exposure			Mercury	37.4		
		Thorium-230	0.9				Nickel	33.0		
		Total PAH	1.4				Silver	3.7		
		Uranium-234	2.4				Uranium	8.3		
		Uranium-235	9.5							
		Uranium-238	61.4							
Future Child Resident - surface	4.43E-04	Arsenic	12.5	Ingestion	17.2	15.91	Antimony	2.6	Ingestion	25.7
		Chromium	0.7	Inhalation	1.0		Arsenic	5.0	Inhalation	0.8
		Neptunium-237	7.3	Dermal	9.3		Cobalt	6.4	Dermal	73.5
		PCB, Total	3.5	External	72.5		Iron	7.6		
		Technetium-99	0.3	Exposure			Manganese	1.2		
		Thorium-230	0.9				Mercury	32.2		
		Total PAH	1.4				Nickel	28.0		
		Uranium-234	2.4				Silver	3.1		
		Uranium-235	9.5				Thallium	0.7		
		Uranium-238	61.4				Uranium	12.0		
Future Teen Recreational User - surface	2.69E-05	Arsenic	37.0	Ingestion	6.9	4.44	Antimony	2.9	Ingestion	1.3
		PCB, Total	5.9	Inhalation	1.6		Cobalt	3.7	Inhalation	0.2
		Total PAH	17.0	Dermal	41.9		Iron	4.5	Dermal	98.4
		Uranium-235	4.8	External	49.7		Mercury	39.4		
		Uranium-238	29.6	Exposure			Nickel	34.9		
							Silver	3.9		
							Uranium	7.0		

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.114. Summary of Risk Characterization for SWMU 14, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.97E-06	PCB, Total Uranium-238	30.0 33.7	Ingestion Inhalation Dermal External Exposure	7.9 19.1 25.9 47.1	<1	Nickel	72.4	Ingestion Inhalation Dermal	4.0 0.5 95.5
Future Industrial Worker - surface	8.87E-05	Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	16.7 11.0 30.0 2.0 6.5 33.7	Ingestion Inhalation Dermal External Exposure	7.9 19.1 25.9 47.1	3.11	Antimony Nickel Silver Uranium	3.4 72.4 3.6 17.4	Ingestion Inhalation Dermal	4.0 0.5 95.5
Outdoor Worker - surface	1.10E-04	Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	9.9 7.3 28.0 10.9 4.5 39.3	Ingestion Inhalation Dermal External Exposure	45.2 11.4 15.4 28.0	3.10	Antimony Nickel Uranium	3.2 58.6 32.3	Ingestion Inhalation Dermal	28.7 0.3 71.0
Outdoor Worker - subsurface	1.21E-04	Arsenic Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	20.9 8.9 5.1 25.4 7.5 3.2 28.9	Ingestion Inhalation Dermal External Exposure	50.8 10.2 18.8 20.3	3.28	Arsenic Nickel Silver Uranium	4.8 55.3 3.3 30.4	Ingestion Inhalation Dermal	31.1 0.7 68.3

Table D6.114. Summary of Risk Characterization for SWMU 14, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.52E-06			See Outdoor Worker (subsurface)		1.03	Nickel Uranium	55.3 30.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.39E-04	Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	8.5 14.5 23.1 2.1 8.5 43.3	Ingestion Inhalation Dermal External Exposure	10.9 9.7 17.4 62.1	5.41	Antimony Nickel Silver Uranium	3.4 71.0 3.5 18.9	Ingestion Inhalation Dermal	6.5 0.2 93.3
Future Child Resident - surface	3.39E-04	Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	8.5 14.5 23.1 2.1 8.5 43.3	Ingestion Inhalation Dermal External Exposure	10.9 9.7 17.4 62.1	14.89	Antimony Chromium Mercury Nickel Silver Uranium	3.3 1.4 1.1 62.4 3.1 28.2	Ingestion Inhalation Dermal	21.9 0.4 77.6
Future Teen Recreational User - surface	2.88E-05	Chromium Neptunium-237 PCB, Total Uranium-235 Uranium-238	9.4 7.1 58.0 4.1 20.6	Ingestion Inhalation Dermal External Exposure	3.2 10.7 55.7 30.4	4.37	Antimony Nickel Silver Uranium	3.5 74.0 3.6 15.6	Ingestion Inhalation Dermal	1.1 0.1 98.8

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.115. Summary of Risk Characterization for SWMU 14, EU 7

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.27E-06	PCB, Total	53.1	Ingestion	10.3	<1	Nickel	68.8	Ingestion	2.8
				Inhalation	6.9				Inhalation	0.4
				Dermal	58.1				Dermal	96.7
				External Exposure	24.8					
Future Industrial Worker - surface	7.63E-05	Arsenic	14.9	Ingestion	10.3	4.15	Mercury	20.9	Ingestion	2.8
		Chromium	2.8	Inhalation	6.9		Nickel	68.8	Inhalation	0.4
		Neptunium-237	7.2	Dermal	58.1		Uranium	7.5	Dermal	96.7
		PCB, Total	53.1	External Exposure	24.8					
		Total PAH	1.4							
		Uranium-235	3.2							
		Uranium-238	16.4							
Outdoor Worker - surface	1.06E-04	Arsenic	25.6	Ingestion	52.4	3.82	Arsenic	4.4	Ingestion	21.9
		Chromium	1.5	Inhalation	3.7		Mercury	19.0	Inhalation	0.3
		Neptunium-237	4.3	Dermal	30.8		Nickel	60.3	Dermal	77.8
		PCB, Total	44.1	External Exposure	13.1		Uranium	15.1		
		Total PAH	1.2							
		Uranium-234	4.2							
		Uranium-235	2.0							
		Uranium-238	17.1							
Outdoor Worker - subsurface	9.90E-05	Arsenic	27.4	Ingestion	52.4	3.96	Arsenic	4.3	Ingestion	21.6
		Chromium	1.6	Inhalation	3.9		Mercury	18.3	Inhalation	0.6
		Neptunium-237	3.6	Dermal	32.9		Nickel	58.1	Dermal	77.8
		PCB, Total	47.4	External Exposure	10.8		Silver	3.1		
		Total PAH	1.0				Uranium	14.5		
		Uranium-234	3.5							
		Uranium-235	1.6							
		Uranium-238	13.8							

Table D6.115. Summary of Risk Characterization for SWMU 14, EU 7 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.24E-06			See Outdoor Worker (subsurface)		1.24	Mercury Nickel Uranium	18.3 58.1 14.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.79E-04	Arsenic Chromium Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	17.2 1.5 9.9 42.7 1.2 1.0 4.4 22.1	Ingestion Inhalation Dermal External Exposure	21.4 3.6 40.8 34.2	7.17	Arsenic Mercury Nickel Uranium	2.0 20.8 68.0 8.2	Ingestion Inhalation Dermal	4.6 0.2 95.2
Future Child Resident - surface	2.79E-04	Arsenic Chromium Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	17.2 1.5 9.9 42.7 1.2 1.0 4.4 22.1	Ingestion Inhalation Dermal External Exposure	21.4 3.6 40.8 34.2	18.78	Antimony Arsenic Mercury Nickel Uranium	0.7 3.7 19.5 62.8 12.9	Ingestion Inhalation Dermal	16.4 0.4 83.2
Future Teen Recreational User - surface	3.71E-05	Arsenic Neptunium-237 PCB, Total Uranium-238	17.2 3.1 68.5 6.7	Ingestion Inhalation Dermal External Exposure	3.4 2.6 83.3 10.7	5.89	Mercury Nickel Uranium	21.2 69.7 6.7	Ingestion Inhalation Dermal	0.8 0.1 99.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.116. Summary of Risk Characterization for SWMU 14, EU 8

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.69E-06	PCB, Total	55.5	Ingestion	10.9	<1	*no COCs			
				Inhalation	7.3					
				Dermal	67.4					
				External Exposure	14.3					
Future Industrial Worker - surface	4.80E-05	Arsenic	23.8	Ingestion	10.9	2.95	Mercury	29.7	Ingestion	3.5
		Chromium	3.2	Inhalation	7.3		Nickel	53.2	Inhalation	0.3
		Neptunium-237	6.8	Dermal	67.4		Uranium	10.6	Dermal	96.1
		PCB, Total	55.5	External Exposure	14.3					
		Total PAH	2.2							
		Uranium-238	7.2							
Outdoor Worker - surface	6.90E-05	Arsenic	39.8	Ingestion	54.1	2.85	Arsenic	6.0	Ingestion	26.0
		Chromium	1.6	Inhalation	3.8		Mercury	25.7	Inhalation	0.3
		Neptunium-237	3.9	Dermal	34.7		Nickel	44.5	Dermal	73.7
		PCB, Total	44.7	External Exposure	7.4		Uranium	20.3		
		Total PAH	1.9							
		Uranium-238	7.3							
Outdoor Worker - subsurface	6.82E-05	Arsenic	43.1	Ingestion	55.2	3.08	Arsenic	5.9	Ingestion	27.6
		Chromium	1.8	Inhalation	4.0		Mercury	26.1	Inhalation	0.3
		Neptunium-237	3.0	Dermal	35.4		Nickel	41.1	Dermal	72.1
		PCB, Total	45.2	External Exposure	5.3		Uranium	22.7		
		Uranium-238	5.0							

Table D6.116. Summary of Risk Characterization for SWMU 14, EU 8 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury Nickel Uranium	26.1 41.1 22.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.69E-04	Arsenic Chromium Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	28.5 1.7 9.6 46.2 1.9 1.8 10.1	Ingestion Inhalation Dermal External Exposure	26.5 4.1 49.0 20.4	5.12	Arsenic Mercury Nickel Silver Uranium	2.8 29.4 52.3 3.0 11.5	Ingestion Inhalation Dermal	5.7 0.2 94.1
Future Child Resident - surface	1.69E-04	Arsenic Chromium Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	28.5 1.7 9.6 46.2 1.9 1.8 10.1	Ingestion Inhalation Dermal External Exposure	26.5 4.1 49.0 20.4	13.82	Antimony Arsenic Mercury Nickel Silver Uranium	0.8 5.0 26.8 46.9 2.7 17.6	Ingestion Inhalation Dermal	19.7 0.3 80.0
Future Teen Recreational User - surface	2.56E-05	Arsenic PCB, Total	25.1 65.3	Ingestion Inhalation Dermal External Exposure	3.6 2.5 88.2 5.6	4.17	Mercury Nickel Silver Uranium	30.3 54.1 3.1 9.5	Ingestion Inhalation Dermal	0.9 0.1 99.0

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.117. Summary of Risk Characterization for SWMU 14, EU 9

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.57E-05	Neptunium-237	4.1	Ingestion	13.1	<1	*no COCs			
		PCB, Total	3.7	Inhalation	0.9					
		Uranium-234	4.4	Dermal	5.0					
		Uranium-235	13.9	External	81.1					
		Uranium-238	71.0	Exposure						
Future Industrial Worker -	6.77E-05	Arsenic	1.4	Ingestion	13.1	3.87	Mercury	3.2	Ingestion	7.5
		Cesium-137	0.5	Inhalation	0.9		Nickel	56.9	Inhalation	0.5
		Chromium	0.2	Dermal	5.0		Uranium	35.3	Dermal	92.1
		Neptunium-237	4.1	External	81.1					
		PCB, Total	3.7	Exposure						
		Total PAH	0.8							
		Uranium-234	4.4							
		Uranium-235	13.9							
		Uranium-238	71.0							
Outdoor Worker - surface	1.15E-04	Arsenic	2.2	Ingestion	59.2	4.71	Arsenic	4.5	Ingestion	43.7
		Cesium-137	0.3	Inhalation	0.4		Mercury	2.2	Inhalation	0.3
		Chromium	0.1	Dermal	2.3		Nickel	37.8	Dermal	56.0
		Neptunium-237	2.1	External	38.1		Uranium	53.8		
		PCB, Total	2.7	Exposure						
		Technetium-99	0.2							
		Total PAH	0.6							
		Uranium-234	18.8							
		Uranium-235	7.7							
		Uranium-238	65.4							
Outdoor Worker - subsurface	1.83E-04	Arsenic	2.1	Ingestion	59.1	4.7	Arsenic	4.4	Ingestion	43.7
		Cesium-137	0.3	Inhalation	0.4		Mercury	2.2	Inhalation	0.3
		Chromium	0.1	Dermal	2.3		Nickel	37.8	Dermal	56.0
		Neptunium-237	2.1	External	38.1		Uranium	53.8		
		PCB, Total	2.7	Exposure						
		Technetium-99	0.2							
		Total PAH	0.6							
		Uranium-234	18.8							
		Uranium-235	7.7							
		Uranium-238	65.4							

Table D6.117. Summary of Risk Characterization for SWMU 14, EU 9 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.96E-05	Uranium-234	18.8	See Outdoor Worker (subsurface)		1.47	Nickel	37.8	See Outdoor Worker (subsurface) for %	
		Uranium-235	7.7				Uranium	53.8		
		Uranium-238	65.4							
Future Adult Resident - surface	4.76E-03	Arsenic	1.3	Ingestion	11.7	6.88	Antimony	2.0	Ingestion	11.8
		Cesium-137	0.6	Inhalation	0.3		Arsenic	2.5	Inhalation	0.2
		Chromium	0.1	Dermal	2.7		Mercury	3.1	Dermal	88.0
		Neptunium-237	4.3	External	85.3		Nickel	54.6		
		PCB, Total	2.3	Exposure			Uranium	37.5		
		Technetium-99	0.0							
		Total PAH	0.5							
		Uranium-234	3.6							
		Uranium-235	14.6							
		Uranium-238	72.9							
Future Child Resident - surface	4.76E-03	Arsenic	1.3	Ingestion	11.7	21.51	Antimony	1.7	Ingestion	35.2
		Cesium-137	0.6	Inhalation	0.3		Arsenic	4.0	Inhalation	0.4
		Chromium	0.1	Dermal	2.7		Mercury	2.5	Dermal	64.5
		Neptunium-237	4.3	External	85.3		Nickel	42.3		
		PCB, Total	2.3	Exposure			Uranium	49.5		
		Technetium-99	0.0							
		Total PAH	0.5							
		Uranium-234	3.6							
		Uranium-235	14.6							
		Uranium-238	72.9							
Future Teen Recreational User - surface	2.20E-04	Arsenic	3.6							
		Cesium-137	0.5	Ingestion	6.8	5.3	Antimony	2.1	Ingestion	2.1
		Neptunium-237	3.8	Inhalation	0.6		Arsenic	1.9	Inhalation	0.1
		PCB, Total	10.4	Dermal	15.7		Mercury	3.4	Dermal	97.8
		Total PAH	2.5	External	76.9		Nickel	59.8		
		Uranium-234	2.3	Exposure			Uranium	32.5		
		Uranium-235	13.1							
		Uranium-238	63.7							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.118. Summary of Risk Characterization for SWMU 14, EU 10

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.98E-06	PCB, Total	46.8	Ingestion	10.0	<1	Mercury	59.4	Ingestion	3.0
		Uranium-238	22.5	Inhalation	4.9				Inhalation	0.2
				Dermal	52.1				Dermal	96.8
				External Exposure	33.0					
Future Industrial Worker - surface	1.07E-04	Arsenic	10.6	Ingestion	10.0	4.69	Iron	2.3	Ingestion	3.0
		Chromium	1.3	Inhalation	4.9		Mercury	59.4	Inhalation	0.2
		Neptunium-237	9.1	Dermal	52.1		Nickel	29.9	Dermal	96.8
		PCB, Total	46.8	External	33.0		Uranium	5.7		
		Total PAH	4.3	Exposure						
		Uranium-234	1.2							
		Uranium-235	4.2							
		Uranium-238	22.5							
Outdoor Worker - surface	1.47E-04	Arsenic	18.4	Ingestion	51.6	4.38	Arsenic	3.9	Ingestion	23.2
		Chromium	0.7	Inhalation	2.6		Iron	4.6	Inhalation	0.2
		Neptunium-237	5.5	Dermal	28.0		Mercury	53.0	Dermal	76.7
		PCB, Total	39.4	External	17.8		Nickel	25.8		
		Total PAH	3.8	Exposure			Uranium	11.4		
		Uranium-234	5.8							
		Uranium-235	2.6							
		Uranium-238	23.7							
Outdoor Worker - subsurface	1.30E-04	Arsenic	21.4	Ingestion	51.6	4.44	Arsenic	3.9	Ingestion	23.1
		Chromium	0.8	Inhalation	3.0		Iron	4.5	Inhalation	0.4
		Neptunium-237	4.8	Dermal	31.2		Mercury	51.9	Dermal	76.5
		PCB, Total	44.3	External	14.2		Nickel	24.6		
		Total PAH	3.3	Exposure			Uranium	10.9		
		Uranium-234	5.2							
		Uranium-235	2.4							
		Uranium-238	17.7							

Table D6.118. Summary of Risk Characterization for SWMU 14, EU 10 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.62E-06			See Outdoor Worker (subsurface)		1.39	Mercury	51.9	See Outdoor Worker (subsurface) for %	
							Nickel	24.6		
							Uranium	10.9		
Future Adult Resident - surface	4.06E-04	Arsenic	11.8	Ingestion	18.6	8.12	Arsenic	1.7	Ingestion	4.9
		Chromium	0.7	Inhalation	2.5		Iron	2.6	Inhalation	0.1
		Neptunium-237	12.0	Dermal	35.2		Mercury	58.9	Dermal	95.0
		PCB, Total	36.2	External	43.8		Nickel	29.5		
		Total PAH	3.4	Exposure			Uranium	6.3		
		Uranium-234	1.2							
		Uranium-235	5.5							
		Uranium-238	29.1							
Future Child Resident - surface	4.06E-04	Arsenic	11.8	Ingestion	18.6	21.45	Antimony	0.8	Ingestion	17.4
		Chromium	0.7	Inhalation	2.5		Arsenic	3.2	Inhalation	0.2
		Neptunium-237	12.0	Dermal	35.2		Iron	4.0	Dermal	82.4
		PCB, Total	36.2	External	43.8		Mercury	54.8		
		Total PAH	3.4	Exposure			Nickel	27.0		
		Uranium-234	1.2				Uranium	9.8		
		Uranium-235	5.5							
		Uranium-238	29.1							
Future Teen Recreational User - surface	4.89E-05	Arsenic	13.0	Ingestion	3.4	6.66	Iron	2.1	Ingestion	0.8
		Neptunium-237	4.2	Inhalation	1.9		Mercury	60.2	Inhalation	0.1
		PCB, Total	64.2	Dermal	79.5		Nickel	30.3	Dermal	99.1
		Total PAH	6.2	External	15.2		Uranium	5.1		
		Uranium-238	9.8	Exposure						

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.119. Summary of Risk Characterization for SWMU 518

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.71E-05	Total PAH	99.3	Ingestion Inhalation Dermal External Exposure	7.6 0.2 92.1 0.1	<1	*no COCs			
Future Industrial Worker - surface	6.63E-04	PCB, Total Total PAH	0.5 99.3	Ingestion Inhalation Dermal External Exposure	7.6 0.2 92.1 0.1	<1	Uranium	66.2	Ingestion Inhalation Dermal	15.5 0.8 83.7
Outdoor Worker - surface	8.09E-04	PCB, Total Total PAH Uranium-238	0.5 99.3 0.2	Ingestion Inhalation Dermal External Exposure	44.0 0.1 55.8 0.1	<1	Cobalt Uranium	22.4 71.0	Ingestion Inhalation Dermal	63.8 0.3 35.8
Outdoor Worker - subsurface	8.25E-04	Arsenic PCB, Total Total PAH Uranium-238	1.9 0.5 97.4 0.2	Ingestion Inhalation Dermal External Exposure	44.6 0.1 55.2 0.1	<1	Cobalt Uranium	18.9 60.0	Ingestion Inhalation Dermal	65.9 0.4 33.8

Table D6.119. Summary of Risk Characterization for SWMU 518 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.03E-05	Total PAH	97.4	See Outdoor Worker (subsurface)		<1	Uranium	60.0	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.02E-03	Carbazole PCB, Total Total PAH Uranium-238	0.1 0.5 99.2 0.2	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.5 0.2	<1	Cobalt Uranium	21.2 67.1	Ingestion Inhalation Dermal	23.3 0.4 76.3
Future Child Resident - surface	2.02E-03	Carbazole PCB, Total Total PAH Uranium-238	0.1 0.5 99.2 0.2	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.5 0.2	2.25	Cobalt Nickel Uranium	22.2 5.5 70.1	Ingestion Inhalation Dermal	55.2 0.5 44.3
Future Teen Recreational User - surface	4.36E-04	PCB, Total Total PAH	0.5 99.4	Ingestion Inhalation Dermal External Exposure	2.1 0.1 97.8 0.0	<1	Uranium	65.4	Ingestion Inhalation Dermal	4.6 0.2 95.2

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.120. Summary of Risk Characterization for SWMU 520, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.04E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.87E-05	Cesium-137 Chromium Neptunium-237 Uranium-238	59.9 5.6 13.0 12.4	Ingestion Inhalation Dermal External Exposure	5.7 6.2 2.7 85.4	2.00	Mercury Nickel Silver	59.3 30.4 6.0	Ingestion Inhalation Dermal	2.0 0.2 97.9
Outdoor Worker - surface	2.06E-05	Cesium-137 Neptunium-237 Thorium-230 Uranium-238	40.5 9.7 25.1 16.3	Ingestion Inhalation Dermal External Exposure	36.8 4.1 1.8 57.3	1.73	Iron Mercury Nickel	6.6 57.0 28.3	Ingestion Inhalation Dermal	16.3 0.1 83.6
Outdoor Worker - subsurface	4.05E-05	Arsenic Cesium-137 Chromium Neptunium-237 Thorium-230 Uranium-238	52.5 18.3 3.6 4.0 11.5 7.8	Ingestion Inhalation Dermal External Exposure	57.6 3.9 12.8 25.7	2.18	Arsenic Cobalt Iron Mercury Nickel Silver	6.1 8.6 5.8 45.4 22.1 4.8	Ingestion Inhalation Dermal	25.9 0.8 73.2

Table D6.120. Summary of Risk Characterization for SWMU 520, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury Nickel	45.4 22.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.83E-05	Cesium-137 Chromium Neptunium-237 Thorium-230 Total PAH Uranium-235 Uranium-238	63.7 2.3 13.8 3.6 1.9 1.8 12.9	Ingestion Inhalation Dermal External Exposure	5.1 2.5 1.4 91.0	3.44	Iron Mercury Nickel Silver	3.4 59.1 30.1 6.0	Ingestion Inhalation Dermal	3.2 0.1 96.7
Future Child Resident - surface	8.83E-05	Cesium-137 Chromium Neptunium-237 Thorium-230 Total PAH Uranium-235 Uranium-238	63.7 2.3 13.8 3.6 1.9 1.8 12.9	Ingestion Inhalation Dermal External Exposure	5.1 2.5 1.4 91.0	8.68	Iron Mercury Nickel Silver Uranium	5.6 57.7 28.9 5.7 1.9	Ingestion Inhalation Dermal	12.0 0.2 87.9
Future Teen Recreational User - surface	4.02E-06	Cesium-137	58.3	Ingestion Inhalation Dermal External Exposure	3.0 5.1 8.6 83.2	2.87	Mercury Nickel Silver	59.6 30.5 6.1	Ingestion Inhalation Dermal	0.5 0.0 99.4

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.121. Summary of Risk Characterization for SWMU 520, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	8.92E-06	Chromium Total PAH Uranium-238	24.8 60.0 11.7	Ingestion Inhalation Dermal External Exposure	5.9 25.3 55.4 13.4	2.13	Mercury Nickel	62.1 34.1	Ingestion Inhalation Dermal	1.7 0.8 97.5
Outdoor Worker - surface	9.94E-06	Chromium Total PAH Uranium-238	16.4 65.8 15.3	Ingestion Inhalation Dermal External Exposure	37.5 16.8 36.8 8.9	1.80	Mercury Nickel	61.1 32.5	Ingestion Inhalation Dermal	14.1 0.7 85.2
Outdoor Worker - subsurface	7.95E-05	Arsenic Chromium Radium-226 Total PAH Uranium-238	29.9 2.1 59.5 6.6 1.7	Ingestion Inhalation Dermal External Exposure	30.1 2.1 10.5 57.3	1.94	Arsenic Mercury Nickel	7.6 56.7 30.1	Ingestion Inhalation Dermal	19.0 0.7 80.3

Table D6.121. Summary of Risk Characterization for SWMU 520, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury Nickel	56.7 30.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.72E-05	Chromium Neptunium-237 Total PAH Uranium-238	15.8 5.1 60.0 18.9	Ingestion Inhalation Dermal External Exposure	15.1 16.1 46.6 22.2	3.64	Mercury Nickel	62.2 34.0	Ingestion Inhalation Dermal	2.7 0.4 96.8
Future Child Resident - surface	2.72E-05	Chromium Neptunium-237 Total PAH Uranium-238	15.8 5.1 60.0 18.9	Ingestion Inhalation Dermal External Exposure	15.1 16.1 46.6 22.2	9.08	Manganese Mercury Nickel Uranium	1.5 61.3 33.0 3.2	Ingestion Inhalation Dermal	10.3 0.8 88.9
Future Teen Recreational User - surface	4.20E-06	Total PAH	83.9	Ingestion Inhalation Dermal External Exposure	2.1 9.8 82.2 6.0	3.04	Mercury Nickel	62.5 34.3	Ingestion Inhalation Dermal	0.4 0.2 99.3

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.122. Summary of Risk Characterization for SWMU 520, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.26E-06	Chromium Total PAH	30.9 46.8	Ingestion Inhalation Dermal External Exposure	6.0 31.7 43.2 19.2	<1	Nickel Silver	80.6 15.3	Ingestion Inhalation Dermal	1.6 0.4 98.0
Outdoor Worker - surface	4.77E-06	Total PAH Uranium-238	51.1 28.1	Ingestion Inhalation Dermal External Exposure	37.8 20.9 28.6 12.7	<1	Nickel	77.2	Ingestion Inhalation Dermal	13.5 0.4 86.1
Outdoor Worker - subsurface	2.95E-05	Arsenic Chromium Total PAH Uranium-238	85.4 5.5 5.2 3.9	Ingestion Inhalation Dermal External Exposure	70.4 5.6 22.3 1.7	1.54	Arsenic Mercury Nickel	10.2 39.9 40.4	Ingestion Inhalation Dermal	19.2 0.2 80.6

Table D6.122. Summary of Risk Characterization for SWMU 520, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury Nickel	39.9 40.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.32E-05	Chromium Total PAH Uranium-238	19.3 46.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 19.8 35.7 31.2	1.31	Nickel Silver	80.3 15.3	Ingestion Inhalation Dermal	2.6 0.2 97.1
Future Child Resident - surface	1.32E-05	Chromium Total PAH Uranium-238	19.3 46.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 19.8 35.7 31.2	3.26	Nickel Silver Uranium	78.3 14.9 4.3	Ingestion Inhalation Dermal	9.9 0.4 89.7
Future Teen Recreational User - surface	1.74E-06	Total PAH	75.4	Ingestion Inhalation Dermal External Exposure	2.2 14.1 73.8 9.9	1.10	Nickel Silver	80.9 15.5	Ingestion Inhalation Dermal	0.4 0.1 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.123. Summary of Risk Characterization for SWMU 520, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.76E-05	Chromium Neptunium-237 Total PAH Uranium-238	7.2 15.5 52.9 20.9	Ingestion Inhalation Dermal External Exposure	6.6 7.5 48.8 37.1	1.87	Mercury Nickel	57.7 35.3	Ingestion Inhalation Dermal	1.6 0.2 98.3
Outdoor Worker - surface	2.05E-05	Neptunium-237 Total PAH Uranium-238	11.0 55.6 26.1	Ingestion Inhalation Dermal External Exposure	40.4 4.8 31.1 23.7	1.57	Mercury Nickel	57.3 33.9	Ingestion Inhalation Dermal	13.2 0.2 86.7
Outdoor Worker - subsurface	4.37E-05	Arsenic Chromium Neptunium-237 Total PAH Uranium-238	51.6 3.7 5.2 26.1 12.2	Ingestion Inhalation Dermal External Exposure	58.8 3.8 26.3 11.1	1.93	Arsenic Iron Mercury Nickel	7.3 6.3 46.5 27.5	Ingestion Inhalation Dermal	23.1 0.7 76.2

Table D6.123. Summary of Risk Characterization for SWMU 520, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury Nickel	46.5 27.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.58E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	3.7 20.8 43.2 4.7 27.5	Ingestion Inhalation Dermal External Exposure	12.4 3.9 33.5 50.1	3.20	Mercury Nickel Silver	57.7 35.1 5.2	Ingestion Inhalation Dermal	2.5 0.1 97.4
Future Child Resident - surface	6.58E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	3.7 20.8 43.2 4.7 27.5	Ingestion Inhalation Dermal External Exposure	12.4 3.9 33.5 50.1	7.91	Mercury Nickel Silver Uranium	57.4 34.3 5.1 2.2	Ingestion Inhalation Dermal	9.6 0.2 90.2
Future Teen Recreational User - surface	7.81E-06	Total PAH	78.7	Ingestion Inhalation Dermal External Exposure	2.3 3.1 77.0 17.6	2.68	Mercury Nickel Silver	57.8 35.3 5.2	Ingestion Inhalation Dermal	0.4 0.1 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.124. Summary of Risk Characterization for SWMU 520, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	9.20E-06	Chromium Total PAH	13.3 71.1	Ingestion Inhalation Dermal External Exposure	6.5 13.6 65.6 14.3	<1	Nickel	89.0	Ingestion Inhalation Dermal	1.2 0.5 98.3
Outdoor Worker - surface	1.06E-05	Total PAH Uranium-238	75.3 11.7	Ingestion Inhalation Dermal External Exposure	40.0 8.7 42.1 9.2	<1	Nickel	87.7	Ingestion Inhalation Dermal	10.8 0.4 88.8
Outdoor Worker - subsurface	3.49E-05	Arsenic Chromium Total PAH Uranium-238	68.8 3.5 22.9 3.5	Ingestion Inhalation Dermal External Exposure	65.3 3.6 28.4 2.8	1.25	Arsenic Iron Mercury Nickel	12.0 10.1 51.6 17.0	Ingestion Inhalation Dermal	27.6 0.9 71.5

Table D6.124. Summary of Risk Characterization for SWMU 520, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	51.6	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.94E-05	Chromium Neptunium-237 Total PAH Uranium-238	8.1 9.8 67.8 14.3	Ingestion Inhalation Dermal External Exposure	16.5 8.2 52.7 22.6	<1	Nickel	88.9	Ingestion Inhalation Dermal	2.0 0.3 97.7
Future Child Resident - surface	2.94E-05	Chromium Neptunium-237 Total PAH Uranium-238	8.1 9.8 67.8 14.3	Ingestion Inhalation Dermal External Exposure	16.5 8.2 52.7 22.6	1.61	Antimony Nickel	10.8 88.1	Ingestion Inhalation Dermal	7.8 0.5 91.7
Future Teen Recreational User - surface	4.82E-06	Total PAH	89.3	Ingestion Inhalation Dermal External Exposure	2.1 4.7 87.4 5.7	<1	Nickel	89.1	Ingestion Inhalation Dermal	0.3 0.1 99.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.125. Summary of Risk Characterization for SWMU 81

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.90E-05	PCB, Total	97.3	Ingestion Inhalation Dermal External Exposure	6.8 7.3 85.8 0.1	<1	Uranium	83.0	Ingestion Inhalation Dermal	15.0 0.4 84.6
Future Industrial Worker - surface	8.75E-04	Arsenic Chromium PCB, Total Total PAH Uranium-238	1.2 0.3 97.3 1.1 0.2	Ingestion Inhalation Dermal External Exposure	6.8 7.3 85.8 0.1	7.31	Mercury Nickel Uranium	12.7 2.3 83.0	Ingestion Inhalation Dermal	15.0 0.4 84.6
Outdoor Worker - surface	1.03E-03	Arsenic Chromium PCB, Total Total PAH Uranium-238	2.4 0.2 96.1 1.1 0.2	Ingestion Inhalation Dermal External Exposure	41.1 4.6 54.2 0.1	12.39	Arsenic Mercury Nickel Uranium	1.2 6.2 1.1 90.7	Ingestion Inhalation Dermal	62.9 0.2 36.9
Outdoor Worker - subsurface	1.03E-03	Arsenic Chromium PCB, Total Total PAH Uranium-238	2.6 0.2 96.0 1.0 0.2	Ingestion Inhalation Dermal External Exposure	41.2 4.5 54.2 0.1	12.76	Arsenic Cobalt Mercury Nickel Uranium	1.3 2.2 6.0 1.1 88.1	Ingestion Inhalation Dermal	62.9 0.3 36.7

Table D6.125. Summary of Risk Characterization for SWMU 81 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.28E-05	PCB, Total	96.0	See Outdoor Worker (subsurface)		3.99	Mercury Uranium	6.0 88.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.59E-03	Arsenic Chromium PCB, Total Total PAH Uranium-238	1.7 0.2 96.7 1.1 0.3	Ingestion Inhalation Dermal External Exposure	20.5 4.8 74.4 0.2	13.60	Arsenic Mercury Nickel Uranium	0.9 11.7 2.1 84.2	Ingestion Inhalation Dermal	22.6 0.2 77.2
Future Child Resident - surface	2.59E-03	Arsenic Chromium PCB, Total Total PAH Uranium-238	1.7 0.2 96.7 1.1 0.3	Ingestion Inhalation Dermal External Exposure	20.5 4.8 74.4 0.2	52.86	Aluminum Arsenic Mercury Nickel Silver Uranium	0.4 1.2 7.4 1.3 0.2 89.3	Ingestion Inhalation Dermal	54.2 0.2 45.5
Future Teen Recreational User - surface	5.47E-04	Arsenic PCB, Total Total PAH	1.1 97.7 1.1	Ingestion Inhalation Dermal External Exposure	2.0 2.1 95.8 0.0	9.42	Mercury Nickel Uranium	14.1 2.6 81.3	Ingestion Inhalation Dermal	4.4 0.1 95.5

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.126. Summary of Risk Characterization for SWMU 153

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.18E-06	PCB, Total Total PAH	64.9 35.1	Ingestion Inhalation Dermal External Exposure	6.9 4.7 88.4	<1	*no COCs			
Outdoor Worker - surface	4.93E-06	PCB, Total Total PAH	63.7 36.3	Ingestion Inhalation Dermal External Exposure	41.6 2.9 55.5	<1	*no COCs			
Outdoor Worker - subsurface	3.07E-05	Arsenic Chromium PCB, Total Total PAH	77.8 5.3 12.0 4.9	Ingestion Inhalation Dermal External Exposure	67.1 5.9 27.0	<1	Arsenic Nickel	34.6 34.3	Ingestion Inhalation Dermal	35.3 2.5 62.2

Table D6.126. Summary of Risk Characterization for SWMU 153 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.24E-05	PCB, Total Total PAH	64.1 35.9	Ingestion Inhalation Dermal External Exposure	20.8 3.1 76.1	<1	*no COCs			
Future Child Resident - surface	1.24E-05	PCB, Total Total PAH	64.1 35.9	Ingestion Inhalation Dermal External Exposure	20.8 3.1 76.1	<1	*no COCs			
Future Teen Recreational User - surface	2.67E-06	PCB, Total	63.8	Ingestion Inhalation Dermal External Exposure	2.0 1.3 96.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.127. Summary of Risk Characterization for SWMU 156

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.91E-06	Chromium PCB, Total Total PAH Uranium-238	27.5 27.0 23.6 21.8	Ingestion Inhalation Dermal External Exposure	6.0 29.6 45.1 19.3	1.38	Manganese Mercury Nickel	8.0 79.6 10.4	Ingestion Inhalation Dermal	2.3 4.6 93.1
Outdoor Worker - surface	6.63E-06	Chromium PCB, Total Total PAH Uranium-238	18.1 27.9 25.7 28.2	Ingestion Inhalation Dermal External Exposure	37.9 19.6 29.8 12.7	1.22	Manganese Mercury Nickel	11.8 75.0 9.5	Ingestion Inhalation Dermal	18.2 3.8 77.9
Outdoor Worker - subsurface	3.38E-05	Arsenic Chromium PCB, Total Total PAH Uranium-238	79.2 4.6 5.5 5.0 5.5	Ingestion Inhalation Dermal External Exposure	68.6 5.0 23.8 2.5	1.79	Arsenic Cobalt Manganese Mercury Nickel	9.3 16.7 8.0 50.9 6.5	Ingestion Inhalation Dermal	31.2 2.8 66.0

Table D6.127. Summary of Risk Characterization for SWMU 156 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	50.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.84E-05	Chromium PCB, Total Total PAH Uranium-238	17.1 25.5 23.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 18.4 37.1 31.2	2.33	Manganese Mercury Nickel	6.4 80.8 10.6	Ingestion Inhalation Dermal	3.8 2.5 93.7
Future Child Resident - surface	1.84E-05	Chromium PCB, Total Total PAH Uranium-238	17.1 25.5 23.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 18.4 37.1 31.2	6.09	Manganese Mercury Nickel Uranium	11.1 76.0 9.8 2.8	Ingestion Inhalation Dermal	13.4 4.5 82.0
Future Teen Recreational User - surface	2.48E-06	PCB, Total	40.5	Ingestion Inhalation Dermal External Exposure	2.2 12.9 75.2 9.7	1.90	Mercury Nickel	83.0 10.9	Ingestion Inhalation Dermal	0.6 1.3 98.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.128. Summary of Risk Characterization for SWMU 160

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.09E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	44.0 0.1 56.0	<1	*no COCs			
Outdoor Worker - subsurface	2.31E-05	Arsenic Chromium Total PAH	85.9 4.9 9.1	Ingestion Inhalation Dermal External Exposure	70.4 5.0 24.6	<1	Arsenic	52.1	Ingestion Inhalation Dermal	45.9 0.2 53.9

Table D6.128. Summary of Risk Characterization for SWMU 160 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.72E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	*no COCs			
Future Child Resident - surface	2.72E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	Antimony	100.0	Ingestion Inhalation Dermal	17.6 82.4
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.129. Summary of Risk Characterization for SWMU 163

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.39E-06	Chromium Total PAH	37.3 62.7	Ingestion Inhalation Dermal External Exposure	4.7 37.4 57.9	<1	*no COCs			
Outdoor Worker - surface	4.57E-06	Chromium Total PAH	26.5 73.5	Ingestion Inhalation Dermal External Exposure	32.3 26.6 41.1	<1	*no COCs			
Outdoor Worker - subsurface	2.78E-05	Arsenic Chromium Total PAH	86.8 5.2 7.9	Ingestion Inhalation Dermal External Exposure	70.6 5.3 24.2	1.10	Arsenic Mercury Nickel	13.6 63.3 12.9	Ingestion Inhalation Dermal	22.3 0.1 77.6

Table D6.129. Summary of Risk Characterization for SWMU 163 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Mercury	63.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.16E-05	Chromium Total PAH	27.5 72.5	Ingestion Inhalation Dermal External Exposure	16.1 27.6 56.3	<1	*no COCs			
Future Child Resident - surface	1.16E-05	Chromium Total PAH	27.5 72.5	Ingestion Inhalation Dermal External Exposure	16.1 27.6 56.3	<1	*no COCs			
Future Teen Recreational User - surface	2.11E-06	Total PAH	85.9	Ingestion Inhalation Dermal External Exposure	1.8 14.2 84.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.130. Summary of Risk Characterization for SWMU 219

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.57E-06	Neptunium-237 Total PAH Uranium-238	21.9 22.8 46.5	Ingestion Inhalation Dermal External Exposure	7.4 0.3 21.0 71.3	<1	Nickel	100.0	Ingestion Inhalation Dermal	1.0 0.5 98.4
Outdoor Worker - surface	6.74E-06	Neptunium-237 Total PAH Uranium-238	15.0 23.0 55.7	Ingestion Inhalation Dermal External Exposure	43.3 0.2 12.8 43.6	<1	Nickel	100.0	Ingestion Inhalation Dermal	9.2 0.5 90.3
Outdoor Worker - subsurface	6.74E-06	Neptunium-237 Total PAH Uranium-238	15.0 23.0 55.7	Ingestion Inhalation Dermal External Exposure	43.3 0.2 12.8 43.6	<1	Nickel	100.0	Ingestion Inhalation Dermal	9.2 0.5 90.3

Table D6.130. Summary of Risk Characterization for SWMU 219 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.52E-05	Neptunium-237 Total PAH Uranium-235 Uranium-238	24.4 15.3 9.7 50.5	Ingestion Inhalation Dermal External Exposure	8.5 0.1 11.9 79.5	<1	Nickel	100.0	Ingestion Inhalation Dermal	1.7 0.3 98.0
Future Child Resident - surface	2.52E-05	Neptunium-237 Total PAH Uranium-235 Uranium-238	24.4 15.3 9.7 50.5	Ingestion Inhalation Dermal External Exposure	8.5 0.1 11.9 79.5	<1	Nickel	100.0	Ingestion Inhalation Dermal	6.6 0.6 92.8
Future Teen Recreational User - surface	1.71E-06	*no COCs				<1	Nickel	100.0	Ingestion Inhalation Dermal	0.3 0.1 99.6

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D6.131. Summary of Risk Characterization for SWMU 488

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.82E-06	PCB, Total	80.5	Ingestion	6.2	<1	*no COCs			
				Inhalation	5.8					
				Dermal	75.2					
				External Exposure	12.9					
Future Industrial Worker - surface	6.82E-05	Cesium-137	8.9	Ingestion	6.2	<1	*no COCs			
		PCB, Total	80.5	Inhalation	5.8					
		Total PAH	6.2	Dermal	75.2					
		Uranium-238	3.9	External Exposure	12.9					
Outdoor Worker - surface	7.74E-05	Cesium-137	5.8	Ingestion	38.8	<1	*no COCs			
		PCB, Total	82.1	Inhalation	3.8					
		Total PAH	6.7	Dermal	49.0					
		Uranium-238	5.0	External Exposure	8.4					
Outdoor Worker - subsurface	1.00E-04	Arsenic	21.4	Ingestion	46.6	<1	Arsenic	81.5	Ingestion	73.3
		Cesium-137	4.5	Inhalation	4.2				Inhalation	0.3
		Chromium	1.3	Dermal	42.7				Dermal	26.4
		PCB, Total	63.5	External Exposure	6.5					
		Total PAH	5.1							
		Uranium-238	3.9							

Table D6.131. Summary of Risk Characterization for SWMU 488 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.25E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.20E-04	Cesium-137 PCB, Total Total PAH Uranium-235 Uranium-238	13.9 73.5 5.8 0.9 6.0	Ingestion Inhalation Dermal External Exposure	16.6 3.5 59.8 20.1	<1	*no COCs			
Future Child Resident - surface	2.20E-04	Cesium-137 PCB, Total Total PAH Uranium-235 Uranium-238	13.9 73.5 5.8 0.9 6.0	Ingestion Inhalation Dermal External Exposure	16.6 3.5 59.8 20.1	<1	Uranium	100.0	Ingestion Inhalation Dermal	58.7 0.2 41.1
Future Teen Recreational User - surface	3.91E-05	Cesium-137 PCB, Total Total PAH	3.2 88.1 7.1	Ingestion Inhalation Dermal External Exposure	1.9 1.8 91.5 4.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

ATTACHMENT D7

NONDETECT UNCERTAINTY EVALUATION

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D7. NONDETECT UNCERTAINTY EVALUATION

Chemicals of potential concern (COPCs) were selected for each exposure unit (EU) in each solid waste management unit (SWMU) for those analytes that were detected above background and where maximum detected value is greater than the no action level [as defined in the Risk Methods Document (DOE 2011a) for the child residential scenario]. For those analytes that never were detected within an EU, even if the detection limit is greater than the no action level, the analyte was not considered a COPC. Uncertainties are associated with this assumption. To assist in evaluating this uncertainty, the maximum detection limit was used as an exposure point concentration, and hazard index (HI) and excess lifetime cancer risk (ELCR) were calculated for the nondetected analyses. This attachment presents the results of these calculations.

Constituents with detection limits greater than the NAL and background concentrations were screened as COPCs as previously discussed in this BHHRA. The results of the screening are presented in Table D7.1. Several constituents for COPC screening did not have toxicity factors defined in Attachment D4. Those constituents and toxicity factors are listed in Table D7.2.

Chronic daily intakes (CDIs) for noncarcenogens and carcinogens are shown in Tables D7.3 and D7.4. HI and ELCR are calculated in Tables D7.5 and D7.6, respectively. These calculations showed no hazard greater than 1 and no ELCR greater than 2×10^{-6}, which is toward the bottom of the EPA risk range (EPA 1991), for the current industrial worker.

The maximum ELCR for any constituent for the current industrial worker was 1.7×10^{-6} as a result of N-Nitroso-di-n-propylamine.[1] This constituent was not detected in any of the Soils Operable Unit samples and is not expected to be present. Further, this uncertainty evaluation looked at the maximum detection limit for the constituent (2.4 mg/kg). The minimum detection limit at this exposure unit was 0.39 mg/kg, a value that would have resulted in an ELCR $< 1 \times 10^{-6}$ to the current industrial worker.

REFERENCES

EPA 1991. *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, OSWER Directive 9355.0-30.

HHS (U.S. Department of Health and Human Services Public Health Service National Toxicology Program) 2011. *Report on Carcinogens, Twelfth Edition.*

[1] N-Nitrosodi-n-propylamine is considered a human carcinogen. Though there are no known commercial uses of N-nitrosodi-n-propylamine, low levels have been found as a contaminant of wastewater from chemical plants (HHS 2011).

Table D7.1. Surface Soil COPCs for Nondetected Analyses

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	1	1,1,1-Trichloroethane	6.00E-03	mg/kg		1.46E+02	NoA
1	1	1,1,2,2-Tetrachloroethane	6.00E-03	mg/kg		5.62E-01	NoA
1	1	1,1,2-Trichloroethane	6.00E-03	mg/kg		2.30E-02	NoA
1	1	1,1-Dichloroethane	6.00E-03	mg/kg		1.34E+00	NoA
1	1	1,1-Dichloroethene	6.00E-03	mg/kg		2.37E-02	NoA
1	1	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
1	1	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
1	1	1,2-Dichloroethane	6.00E-03	mg/kg		1.55E-01	NoA
1	1	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
1	1	1,2-Dichloropropane	6.00E-03	mg/kg		9.40E-01	NoA
1	1	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
1	1	1,4-Dichlorobenzene	4.40E-01	mg/kg		8.13E-01	NoA
1	1	2,4,5-Trichlorophenol	2.20E+00	mg/kg		3.26E+02	NoA
1	1	2,4,6-Trichlorophenol	4.40E-01	mg/kg		3.26E+00	NoA
1	1	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
1	1	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
1	1	2,4-Dinitrophenol	2.20E+00	mg/kg		6.52E+00	NoA
1	1	2,4-Dinitrotoluene	4.40E-01	mg/kg		5.63E-01	NoA
1	1	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
1	1	2-Butanone	1.20E-02	mg/kg		5.78E+02	NoA
1	1	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA
1	1	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
1	1	2-Hexanone	1.20E-02	mg/kg		4.05E+00	NoA
1	1	2-Methyl-4,6-dinitrophenol	2.20E+00	mg/kg		2.61E-01	Yes
1	1	2-Methylnaphthalene	4.40E-01	mg/kg		1.30E+01	NoA
1	1	2-Methylphenol	4.40E-01	mg/kg		1.54E+02	NoA
1	1	2-Nitrobenzenamine	2.20E+00	mg/kg		2.96E-01	Yes
1	1	2-Nitrophenol	4.40E-01	mg/kg			NoC
1	1	3,3'-Dichlorobenzidine	8.90E-01	mg/kg		3.85E-01	Yes
1	1	3-Nitrobenzenamine	2.20E+00	mg/kg		9.78E-01	Yes
1	1	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
1	1	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
1	1	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
1	1	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
1	1	4-Methyl-2-pentanone	1.20E-02	mg/kg		1.13E+02	NoA
1	1	4-Nitrophenol	2.20E+00	mg/kg			NoC
1	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
1	1	Acenaphthylene	5.00E-01	mg/kg			NoC
1	1	Acetone	3.40E-02	mg/kg		1.34E+03	NoA
1	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
1	1	Antimony	9.65E+00	mg/kg	2.10E-01	5.52E-01	Yes
1	1	Arsenic	4.83E+00	mg/kg	1.20E+01	2.38E-01	NoB
1	1	Benzene	6.00E-03	mg/kg		3.33E-01	NoA
1	1	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
1	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
1	1	Benzoic acid	2.20E+00	mg/kg		1.30E+04	NoA
1	1	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
1	1	Bis(2-chloroethyl) ether	4.40E-01	mg/kg		2.14E-01	Yes
1	1	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	1	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
1	1	Bromodichloromethane	6.00E-03	mg/kg		2.73E-01	NoA
1	1	Bromoform	6.00E-03	mg/kg		2.19E+01	NoA
1	1	Bromomethane	1.20E-02	mg/kg		1.34E-01	NoA
1	1	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
1	1	Carbon disulfide	6.00E-03	mg/kg		1.48E+01	NoA
1	1	Carbon tetrachloride	6.00E-03	mg/kg		2.39E-01	NoA
1	1	Chlorobenzene	6.00E-03	mg/kg		4.07E+00	NoA
1	1	Chloroethane	1.20E-02	mg/kg		1.45E+03	NoA
1	1	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
1	1	Chloromethane	1.20E-02	mg/kg		1.65E+00	NoA
1	1	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
1	1	Dibenzofuran	4.40E-01	mg/kg		3.26E+00	NoA
1	1	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA
1	1	Diethyl phthalate	4.40E-01	mg/kg		2.61E+03	NoA
1	1	Dimethyl phthalate	4.40E-01	mg/kg			NoC
1	1	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
1	1	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA
1	1	Ethylbenzene	6.00E-03	mg/kg		1.58E+00	NoA
1	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
1	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
1	1	Hexachlorobenzene	4.40E-01	mg/kg		4.92E-02	Yes
1	1	Hexachlorobutadiene	4.40E-01	mg/kg		2.22E+00	NoA
1	1	Hexachlorocyclopentadiene	4.40E-01	mg/kg		1.95E+01	NoA
1	1	Hexachloroethane	4.40E-01	mg/kg		2.28E+00	NoA
1	1	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
1	1	Lead	1.93E+01	mg/kg	3.60E+01	4.00E+02	NoAB
1	1	Mercury	1.20E-01	mg/kg	2.00E-01	2.13E-01	NoAB
1	1	Methylene chloride	6.30E-02	mg/kg		3.65E+00	NoA
1	1	Molybdenum	4.83E+00	mg/kg		2.30E+01	NoA
1	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
1	1	Nitrobenzene	4.40E-01	mg/kg		4.79E+00	NoA
1	1	N-Nitroso-di-n-propylamine	4.40E-01	mg/kg		1.89E-02	Yes
1	1	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
1	1	Pentachlorophenol	2.20E+00	mg/kg		4.36E-01	Yes
1	1	Phenanthrene	5.00E-01	mg/kg			NoC
1	1	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
1	1	p-Nitroaniline	2.20E+00	mg/kg		8.66E+00	NoA
1	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
1	1	Selenium	1.93E+01	mg/kg	8.00E-01	2.30E+01	NoA
1	1	Silver	3.20E+00	mg/kg	2.30E+00	2.61E+00	Yes
1	1	Sodium	9.65E+01	mg/kg	3.20E+02		NoBE
1	1	Styrene	6.00E-03	mg/kg		9.43E+01	NoA
1	1	Tetrachloroethene	6.00E-03	mg/kg		1.13E-01	NoA
1	1	Thallium	1.93E+01	mg/kg	2.10E-01	3.68E-01	Yes
1	1	Toluene	6.00E-03	mg/kg		9.61E+01	NoA
1	1	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
1	1	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
1	1	trans-1,3-Dichloropropene	6.00E-03	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	1	Trichloroethene	6.00E-03	mg/kg		2.34E-02	NoA
1	1	Vinyl acetate	1.20E-02	mg/kg		1.83E+01	NoA
1	1	Vinyl chloride	1.20E-02	mg/kg		8.24E-02	NoA
1	2	1,1,1-Trichloroethane	7.00E-03	mg/kg		1.46E+02	NoA
1	2	1,1,2,2-Tetrachloroethane	7.00E-03	mg/kg		5.62E-01	NoA
1	2	1,1,2-Trichloroethane	7.00E-03	mg/kg		2.30E-02	NoA
1	2	1,1-Dichloroethane	7.00E-03	mg/kg		1.34E+00	NoA
1	2	1,1-Dichloroethene	7.00E-03	mg/kg		2.37E-02	NoA
1	2	1,2,4-Trichlorobenzene	4.60E-01	mg/kg		7.86E-01	NoA
1	2	1,2-Dichlorobenzene	4.60E-01	mg/kg		2.92E+01	NoA
1	2	1,2-Dichloroethane	7.00E-03	mg/kg		1.55E-01	NoA
1	2	1,2-Dichloroethene	7.00E-03	mg/kg		1.24E+00	NoA
1	2	1,2-Dichloropropane	7.00E-03	mg/kg		9.40E-01	NoA
1	2	1,3-Dichlorobenzene	4.60E-01	mg/kg			NoC
1	2	1,4-Dichlorobenzene	4.60E-01	mg/kg		8.13E-01	NoA
1	2	2,4,5-Trichlorophenol	2.30E+00	mg/kg		3.26E+02	NoA
1	2	2,4,6-Trichlorophenol	4.60E-01	mg/kg		3.26E+00	NoA
1	2	2,4-Dichlorophenol	4.60E-01	mg/kg		9.78E+00	NoA
1	2	2,4-Dimethylphenol	4.60E-01	mg/kg		6.52E+01	NoA
1	2	2,4-Dinitrophenol	2.30E+00	mg/kg		6.52E+00	NoA
1	2	2,4-Dinitrotoluene	4.60E-01	mg/kg		5.63E-01	NoA
1	2	2,6-Dinitrotoluene	4.60E-01	mg/kg		3.26E+00	NoA
1	2	2-Butanone	1.40E-02	mg/kg		5.78E+02	NoA
1	2	2-Chloronaphthalene	4.60E-01	mg/kg		6.26E+02	NoA
1	2	2-Chlorophenol	4.60E-01	mg/kg		3.91E+01	NoA
1	2	2-Hexanone	1.40E-02	mg/kg		4.05E+00	NoA
1	2	2-Methyl-4,6-dinitrophenol	2.30E+00	mg/kg		2.61E-01	Yes
1	2	2-Methylnaphthalene	4.60E-01	mg/kg		1.30E+01	NoA
1	2	2-Methylphenol	4.60E-01	mg/kg		1.54E+02	NoA
1	2	2-Nitrobenzenamine	2.30E+00	mg/kg		2.96E-01	Yes
1	2	2-Nitrophenol	4.60E-01	mg/kg			NoC
1	2	3,3'-Dichlorobenzidine	9.30E-01	mg/kg		3.85E-01	Yes
1	2	3-Nitrobenzenamine	2.30E+00	mg/kg		9.78E-01	Yes
1	2	4-Bromophenyl phenyl ether	4.60E-01	mg/kg			NoC
1	2	4-Chloro-3-methylphenol	4.60E-01	mg/kg			NoC
1	2	4-Chlorobenzenamine	4.60E-01	mg/kg		8.66E-01	NoA
1	2	4-Chlorophenyl phenyl ether	4.60E-01	mg/kg			NoC
1	2	4-Methyl-2-pentanone	1.40E-02	mg/kg		1.13E+02	NoA
1	2	4-Nitrophenol	2.30E+00	mg/kg			NoC
1	2	Acenaphthene	4.60E-01	mg/kg		1.17E+02	NoA
1	2	Acenaphthylene	4.60E-01	mg/kg			NoC
1	2	Acetone	1.00E-01	mg/kg		1.34E+03	NoA
1	2	Anthracene	4.60E-01	mg/kg		7.47E+02	NoA
1	2	Benzene	7.00E-03	mg/kg		3.33E-01	NoA
1	2	Benzenemethanol	4.60E-01	mg/kg		3.26E+02	NoA
1	2	Benzo(ghi)perylene	4.60E-01	mg/kg			NoC
1	2	Benzoic acid	2.30E+00	mg/kg		1.30E+04	NoA
1	2	Bis(2-chloroethoxy)methane	4.60E-01	mg/kg		9.78E+00	NoA
1	2	Bis(2-chloroethyl) ether	4.60E-01	mg/kg		2.14E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	2	Bis(2-chloroisopropyl) ether	4.60E-01	mg/kg		4.57E+00	NoA
1	2	Bis(2-ethylhexyl)phthalate	4.60E-01	mg/kg		1.25E+01	NoA
1	2	Bromodichloromethane	7.00E-03	mg/kg		2.73E-01	NoA
1	2	Bromoform	7.00E-03	mg/kg		2.19E+01	NoA
1	2	Bromomethane	1.40E-02	mg/kg		1.34E-01	NoA
1	2	Butyl benzyl phthalate	4.60E-01	mg/kg		9.18E+01	NoA
1	2	Carbon disulfide	7.00E-03	mg/kg		1.48E+01	NoA
1	2	Carbon tetrachloride	7.00E-03	mg/kg		2.39E-01	NoA
1	2	Chlorobenzene	7.00E-03	mg/kg		4.07E+00	NoA
1	2	Chloroethane	1.40E-02	mg/kg		1.45E+03	NoA
1	2	Chloroform	7.00E-03	mg/kg		1.22E-01	NoA
1	2	Chloromethane	1.40E-02	mg/kg		1.65E+00	NoA
1	2	cis-1,3-Dichloropropene	7.00E-03	mg/kg			NoC
1	2	Dibenzofuran	4.60E-01	mg/kg		3.26E+00	NoA
1	2	Dibromochloromethane	7.00E-03	mg/kg		2.42E-01	NoA
1	2	Diethyl phthalate	4.60E-01	mg/kg		2.61E+03	NoA
1	2	Dimethyl phthalate	4.60E-01	mg/kg			NoC
1	2	Di-n-butyl phthalate	4.60E-01	mg/kg		3.26E+02	NoA
1	2	Di-n-octylphthalate	4.60E-01	mg/kg		1.30E+02	NoA
1	2	Ethylbenzene	7.00E-03	mg/kg		1.58E+00	NoA
1	2	Fluoranthene	4.60E-01	mg/kg		1.09E+02	NoA
1	2	Fluorene	4.60E-01	mg/kg		9.15E+01	NoA
1	2	Hexachlorobenzene	4.60E-01	mg/kg		4.92E-02	Yes
1	2	Hexachlorobutadiene	4.60E-01	mg/kg		2.22E+00	NoA
1	2	Hexachlorocyclopentadiene	4.60E-01	mg/kg		1.95E+01	NoA
1	2	Hexachloroethane	4.60E-01	mg/kg		2.28E+00	NoA
1	2	Isophorone	4.60E-01	mg/kg		1.82E+02	NoA
1	2	Methylene chloride	7.00E-03	mg/kg		3.65E+00	NoA
1	2	Naphthalene	4.60E-01	mg/kg		1.15E+00	NoA
1	2	Nitrobenzene	4.60E-01	mg/kg		4.79E+00	NoA
1	2	N-Nitroso-di-n-propylamine	4.60E-01	mg/kg		1.89E-02	Yes
1	2	N-Nitrosodiphenylamine	4.60E-01	mg/kg		3.22E+01	NoA
1	2	Pentachlorophenol	2.30E+00	mg/kg		4.36E-01	Yes
1	2	Phenanthrene	4.60E-01	mg/kg			NoC
1	2	Phenol	4.60E-01	mg/kg		4.98E+02	NoA
1	2	p-Nitroaniline	2.30E+00	mg/kg		8.66E+00	NoA
1	2	Pyrene	4.60E-01	mg/kg		8.12E+01	NoA
1	2	Selenium	5.00E-01	mg/kg	8.00E-01	2.30E+01	NoAB
1	2	Sodium	5.02E+01	mg/kg	3.20E+02		NoBE
1	2	Styrene	7.00E-03	mg/kg		9.43E+01	NoA
1	2	Tetrachloroethene	7.00E-03	mg/kg		1.13E-01	NoA
1	2	Toluene	7.00E-03	mg/kg		9.61E+01	NoA
1	2	Total PAH	4.60E-01	mg/kg		1.97E-02	Yes
1	2	Total Xylene	7.00E-03	mg/kg		7.96E+00	NoA
1	2	trans-1,3-Dichloropropene	7.00E-03	mg/kg			NoC
1	2	Trichloroethene	7.00E-03	mg/kg		2.34E-02	NoA
1	2	Vinyl acetate	1.40E-02	mg/kg		1.83E+01	NoA
1	2	Vinyl chloride	1.40E-02	mg/kg		8.24E-02	NoA
1	3	1,1,1-Trichloroethane	5.00E-03	mg/kg		1.46E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	3	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
1	3	1,2,4-Trichlorobenzene	3.30E-01	mg/kg		7.86E-01	NoA
1	3	1,2-Dichlorobenzene	3.30E-01	mg/kg		2.92E+01	NoA
1	3	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
1	3	1,3-Dichlorobenzene	3.30E-01	mg/kg			NoC
1	3	1,4-Dichlorobenzene	2.30E+00	mg/kg		8.13E-01	Yes
1	3	2,4,5-Trichlorophenol	2.30E+00	mg/kg		3.26E+02	NoA
1	3	2,4,6-Trichlorophenol	2.30E+00	mg/kg		3.26E+00	NoA
1	3	2,4-Dichlorophenol	3.30E-01	mg/kg		9.78E+00	NoA
1	3	2,4-Dimethylphenol	3.30E-01	mg/kg		6.52E+01	NoA
1	3	2,4-Dinitrophenol	2.30E+00	mg/kg		6.52E+00	NoA
1	3	2,4-Dinitrotoluene	3.30E-01	mg/kg		5.63E-01	NoA
1	3	2,6-Dinitrotoluene	3.30E-01	mg/kg		3.26E+00	NoA
1	3	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
1	3	2-Chloronaphthalene	3.30E-01	mg/kg		6.26E+02	NoA
1	3	2-Chlorophenol	3.30E-01	mg/kg		3.91E+01	NoA
1	3	2-Methyl-4,6-dinitrophenol	1.65E+00	mg/kg		2.61E-01	Yes
1	3	2-Methylnaphthalene	3.30E-01	mg/kg		1.30E+01	NoA
1	3	2-Methylphenol	2.30E+00	mg/kg		1.54E+02	NoA
1	3	2-Nitrobenzenamine	1.65E+00	mg/kg		2.96E-01	Yes
1	3	2-Nitrophenol	3.30E-01	mg/kg			NoC
1	3	3,3'-Dichlorobenzidine	3.30E-01	mg/kg		3.85E-01	NoA
1	3	3-Nitrobenzenamine	1.65E+00	mg/kg		9.78E-01	Yes
1	3	4-Bromophenyl phenyl ether	3.30E-01	mg/kg			NoC
1	3	4-Chloro-3-methylphenol	3.30E-01	mg/kg			NoC
1	3	4-Chlorobenzenamine	3.30E-01	mg/kg		8.66E-01	NoA
1	3	4-Chlorophenyl phenyl ether	3.30E-01	mg/kg			NoC
1	3	4-Nitrophenol	1.65E+00	mg/kg			NoC
1	3	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
1	3	Acenaphthylene	5.00E-01	mg/kg			NoC
1	3	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
1	3	Antimony	1.50E+01	mg/kg	2.10E-01	5.52E-01	Yes
1	3	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
1	3	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
1	3	Benzenemethanol	3.30E-01	mg/kg		3.26E+02	NoA
1	3	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
1	3	Benzoic acid	1.65E+00	mg/kg		1.30E+04	NoA
1	3	Beryllium	4.60E-01	mg/kg	6.70E-01	5.67E-03	NoB
1	3	Bis(2-chloroethoxy)methane	3.30E-01	mg/kg		9.78E+00	NoA
1	3	Bis(2-chloroethyl) ether	3.30E-01	mg/kg		2.14E-01	Yes
1	3	Bis(2-chloroisopropyl) ether	3.30E-01	mg/kg		4.57E+00	NoA
1	3	Bis(2-ethylhexyl)phthalate	3.30E-01	mg/kg		1.25E+01	NoA
1	3	Butyl benzyl phthalate	3.30E-01	mg/kg		9.18E+01	NoA
1	3	Cadmium	3.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
1	3	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
1	3	Chlorobenzene	1.00E-01	mg/kg		4.07E+00	NoA
1	3	Chloroform	1.00E-02	mg/kg		1.22E-01	NoA
1	3	Dibenzofuran	3.30E-01	mg/kg		3.26E+00	NoA
1	3	Diethyl phthalate	3.30E-01	mg/kg		2.61E+03	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	3	Dimethyl phthalate	3.30E-01	mg/kg			NoC
1	3	Di-n-butyl phthalate	3.30E-01	mg/kg		3.26E+02	NoA
1	3	Di-n-octylphthalate	3.30E-01	mg/kg		1.30E+02	NoA
1	3	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
1	3	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
1	3	Hexachlorobenzene	2.30E+00	mg/kg		4.92E-02	Yes
1	3	Hexachlorobutadiene	2.30E+00	mg/kg		2.22E+00	Yes
1	3	Hexachlorocyclopentadiene	3.30E-01	mg/kg		1.95E+01	NoA
1	3	Hexachloroethane	2.30E+00	mg/kg		2.28E+00	Yes
1	3	Isophorone	3.30E-01	mg/kg		1.82E+02	NoA
1	3	Lead	1.84E+01	mg/kg	3.60E+01	4.00E+02	NoAB
1	3	m,p-Cresol	2.30E+00	mg/kg		3.91E+01	NoA
1	3	Mercury	2.00E-01	mg/kg	2.00E-01	2.13E-01	NoA
1	3	Molybdenum	4.60E+00	mg/kg		2.30E+01	NoA
1	3	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
1	3	Nickel	1.00E+01	mg/kg	2.10E+01	1.04E+01	NoAB
1	3	Nitrobenzene	2.30E+00	mg/kg		4.79E+00	NoA
1	3	N-Nitroso-di-n-propylamine	3.30E-01	mg/kg		1.89E-02	Yes
1	3	N-Nitrosodiphenylamine	3.30E-01	mg/kg		3.22E+01	NoA
1	3	Pentachlorophenol	2.30E+00	mg/kg		4.36E-01	Yes
1	3	Phenanthrene	5.00E-01	mg/kg			NoC
1	3	Phenol	3.30E-01	mg/kg		4.98E+02	NoA
1	3	p-Nitroaniline	1.65E+00	mg/kg		8.66E+00	NoA
1	3	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
1	3	Pyridine	2.30E+00	mg/kg		7.82E+00	NoA
1	3	Selenium	1.84E+01	mg/kg	8.00E-01	2.30E+01	NoA
1	3	Silver	4.00E+00	mg/kg	2.30E+00	2.61E+00	Yes
1	3	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
1	3	Thallium	2.50E+01	mg/kg	2.10E-01	3.68E-01	Yes
1	3	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
1	3	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
1	3	Vinyl chloride	1.00E-02	mg/kg		8.24E-02	NoA
1	4	1,1,1-Trichloroethane	6.00E-03	mg/kg		1.46E+02	NoA
1	4	1,1,2,2-Tetrachloroethane	6.00E-03	mg/kg		5.62E-01	NoA
1	4	1,1,2-Trichloroethane	6.00E-03	mg/kg		2.30E-02	NoA
1	4	1,1-Dichloroethane	6.00E-03	mg/kg		1.34E+00	NoA
1	4	1,1-Dichloroethene	6.00E-03	mg/kg		2.37E-02	NoA
1	4	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
1	4	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
1	4	1,2-Dichloroethane	6.00E-03	mg/kg		1.55E-01	NoA
1	4	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
1	4	1,2-Dichloropropane	6.00E-03	mg/kg		9.40E-01	NoA
1	4	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
1	4	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
1	4	2,4,5-Trichlorophenol	1.90E+00	mg/kg		3.26E+02	NoA
1	4	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
1	4	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
1	4	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
1	4	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	4	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
1	4	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
1	4	2-Butanone	1.20E-02	mg/kg		5.78E+02	NoA
1	4	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
1	4	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
1	4	2-Hexanone	1.20E-02	mg/kg		4.05E+00	NoA
1	4	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
1	4	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
1	4	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
1	4	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
1	4	2-Nitrophenol	3.90E-01	mg/kg			NoC
1	4	3,3'-Dichlorobenzidine	7.80E-01	mg/kg		3.85E-01	Yes
1	4	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
1	4	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
1	4	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
1	4	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
1	4	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
1	4	4-Methyl-2-pentanone	1.20E-02	mg/kg		1.13E+02	NoA
1	4	4-Nitrophenol	1.90E+00	mg/kg			NoC
1	4	Acenaphthene	4.80E-01	mg/kg		1.17E+02	NoA
1	4	Acenaphthylene	4.80E-01	mg/kg			NoC
1	4	Acetone	1.20E-02	mg/kg		1.34E+03	NoA
1	4	Anthracene	4.80E-01	mg/kg		7.47E+02	NoA
1	4	Antimony	1.22E+01	mg/kg	2.10E-01	5.52E-01	Yes
1	4	Arsenic	4.49E+00	mg/kg	1.20E+01	2.38E-01	NoB
1	4	Benzene	6.00E-03	mg/kg		3.33E-01	NoA
1	4	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
1	4	Benzo(ghi)perylene	4.80E-01	mg/kg			NoC
1	4	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
1	4	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
1	4	Bis(2-chloroethyl) ether	3.90E-01	mg/kg		2.14E-01	Yes
1	4	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
1	4	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
1	4	Bromodichloromethane	6.00E-03	mg/kg		2.73E-01	NoA
1	4	Bromoform	6.00E-03	mg/kg		2.19E+01	NoA
1	4	Bromomethane	1.20E-02	mg/kg		1.34E-01	NoA
1	4	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
1	4	Cadmium	1.80E+00	mg/kg	2.10E-01	8.11E-01	Yes
1	4	Carbon disulfide	6.00E-03	mg/kg		1.48E+01	NoA
1	4	Carbon tetrachloride	6.00E-03	mg/kg		2.39E-01	NoA
1	4	Chlorobenzene	6.00E-03	mg/kg		4.07E+00	NoA
1	4	Chloroethane	1.20E-02	mg/kg		1.45E+03	NoA
1	4	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
1	4	Chloromethane	1.20E-02	mg/kg		1.65E+00	NoA
1	4	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
1	4	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
1	4	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA
1	4	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
1	4	Dimethyl phthalate	3.90E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	4	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
1	4	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
1	4	Ethylbenzene	6.00E-03	mg/kg		1.58E+00	NoA
1	4	Fluoranthene	4.80E-01	mg/kg		1.09E+02	NoA
1	4	Fluorene	4.80E-01	mg/kg		9.15E+01	NoA
1	4	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
1	4	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
1	4	Hexachlorocyclopentadiene	3.90E-01	mg/kg		1.95E+01	NoA
1	4	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
1	4	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
1	4	Lead	1.80E+01	mg/kg	3.60E+01	4.00E+02	NoAB
1	4	Mercury	1.00E-01	mg/kg	2.00E-01	2.13E-01	NoAB
1	4	Methylene chloride	6.00E-03	mg/kg		3.65E+00	NoA
1	4	Molybdenum	4.49E+00	mg/kg		2.30E+01	NoA
1	4	Naphthalene	4.80E-01	mg/kg		1.15E+00	NoA
1	4	Nitrobenzene	3.90E-01	mg/kg		4.79E+00	NoA
1	4	N-Nitroso-di-n-propylamine	3.90E-01	mg/kg		1.89E-02	Yes
1	4	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
1	4	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
1	4	Phenanthrene	4.80E-01	mg/kg			NoC
1	4	Phenol	3.30E-01	mg/kg		4.98E+02	NoA
1	4	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
1	4	Pyrene	4.80E-01	mg/kg		8.12E+01	NoA
1	4	Selenium	1.80E+01	mg/kg	8.00E-01	2.30E+01	NoA
1	4	Silver	2.25E+00	mg/kg	2.30E+00	2.61E+00	NoAB
1	4	Sodium	8.98E+01	mg/kg	3.20E+02		NoBE
1	4	Styrene	6.00E-03	mg/kg		9.43E+01	NoA
1	4	Tetrachloroethene	6.00E-03	mg/kg		1.13E-01	NoA
1	4	Thallium	1.80E+01	mg/kg	2.10E-01	3.68E-01	Yes
1	4	Toluene	6.00E-03	mg/kg		9.61E+01	NoA
1	4	Total PAH	4.80E-01	mg/kg		1.97E-02	Yes
1	4	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
1	4	trans-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
1	4	Trichloroethene	6.00E-03	mg/kg		2.34E-02	NoA
1	4	Vinyl acetate	1.20E-02	mg/kg		1.83E+01	NoA
1	4	Vinyl chloride	1.20E-02	mg/kg		8.24E-02	NoA
1	5	1,1,1-Trichloroethane	6.00E-03	mg/kg		1.46E+02	NoA
1	5	1,1,2,2-Tetrachloroethane	6.00E-03	mg/kg		5.62E-01	NoA
1	5	1,1,2-Trichloroethane	6.00E-03	mg/kg		2.30E-02	NoA
1	5	1,1-Dichloroethane	6.00E-03	mg/kg		1.34E+00	NoA
1	5	1,1-Dichloroethene	6.00E-03	mg/kg		2.37E-02	NoA
1	5	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
1	5	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
1	5	1,2-Dichloroethane	6.00E-03	mg/kg		1.55E-01	NoA
1	5	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
1	5	1,2-Dichloropropane	6.00E-03	mg/kg		9.40E-01	NoA
1	5	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
1	5	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
1	5	2,4,5-Trichlorophenol	2.10E+00	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	5	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
1	5	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
1	5	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
1	5	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
1	5	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
1	5	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
1	5	2-Butanone	1.30E-02	mg/kg		5.78E+02	NoA
1	5	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
1	5	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
1	5	2-Hexanone	1.30E-02	mg/kg		4.05E+00	NoA
1	5	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
1	5	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
1	5	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
1	5	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
1	5	2-Nitrophenol	4.10E-01	mg/kg			NoC
1	5	3,3'-Dichlorobenzidine	8.20E-01	mg/kg		3.85E-01	Yes
1	5	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
1	5	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
1	5	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
1	5	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
1	5	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
1	5	4-Methyl-2-pentanone	1.30E-02	mg/kg		1.13E+02	NoA
1	5	4-Nitrophenol	2.10E+00	mg/kg			NoC
1	5	Acenaphthene	4.80E-01	mg/kg		1.17E+02	NoA
1	5	Acenaphthylene	4.80E-01	mg/kg			NoC
1	5	Acetone	5.50E-02	mg/kg		1.34E+03	NoA
1	5	Anthracene	4.80E-01	mg/kg		7.47E+02	NoA
1	5	Antimony	9.75E+00	mg/kg	2.10E-01	5.52E-01	Yes
1	5	Benzene	6.00E-03	mg/kg		3.33E-01	NoA
1	5	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
1	5	Benzo(ghi)perylene	4.80E-01	mg/kg			NoC
1	5	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
1	5	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
1	5	Bis(2-chloroethyl) ether	4.10E-01	mg/kg		2.14E-01	Yes
1	5	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
1	5	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
1	5	Bromodichloromethane	6.00E-03	mg/kg		2.73E-01	NoA
1	5	Bromoform	6.00E-03	mg/kg		2.19E+01	NoA
1	5	Bromomethane	1.30E-02	mg/kg		1.34E-01	NoA
1	5	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
1	5	Carbon disulfide	6.00E-03	mg/kg		1.48E+01	NoA
1	5	Carbon tetrachloride	6.00E-03	mg/kg		2.39E-01	NoA
1	5	Chlorobenzene	6.00E-03	mg/kg		4.07E+00	NoA
1	5	Chloroethane	1.30E-02	mg/kg		1.45E+03	NoA
1	5	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
1	5	Chloromethane	1.30E-02	mg/kg		1.65E+00	NoA
1	5	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
1	5	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
1	5	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
1	5	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
1	5	Dimethyl phthalate	4.10E-01	mg/kg			NoC
1	5	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
1	5	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
1	5	Ethylbenzene	6.00E-03	mg/kg		1.58E+00	NoA
1	5	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
1	5	Fluorene	4.80E-01	mg/kg		9.15E+01	NoA
1	5	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
1	5	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
1	5	Hexachlorocyclopentadiene	4.10E-01	mg/kg		1.95E+01	NoA
1	5	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
1	5	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
1	5	Lead	1.95E+01	mg/kg	3.60E+01	4.00E+02	NoAB
1	5	Mercury	1.30E-01	mg/kg	2.00E-01	2.13E-01	NoAB
1	5	Methylene chloride	6.00E-03	mg/kg		3.65E+00	NoA
1	5	Naphthalene	4.80E-01	mg/kg		1.15E+00	NoA
1	5	Nitrobenzene	4.10E-01	mg/kg		4.79E+00	NoA
1	5	N-Nitroso-di-n-propylamine	4.10E-01	mg/kg		1.89E-02	Yes
1	5	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
1	5	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
1	5	Phenanthrene	4.80E-01	mg/kg			NoC
1	5	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
1	5	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
1	5	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
1	5	Selenium	1.95E+01	mg/kg	8.00E-01	2.30E+01	NoA
1	5	Silver	2.44E+00	mg/kg	2.30E+00	2.61E+00	NoA
1	5	Sodium	8.15E+01	mg/kg	3.20E+02		NoBE
1	5	Styrene	6.00E-03	mg/kg		9.43E+01	NoA
1	5	Tetrachloroethene	6.00E-03	mg/kg		1.13E-01	NoA
1	5	Thallium	1.95E+01	mg/kg	2.10E-01	3.68E-01	Yes
1	5	Toluene	6.00E-03	mg/kg		9.61E+01	NoA
1	5	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
1	5	trans-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
1	5	Trichloroethene	6.00E-03	mg/kg		2.34E-02	NoA
1	5	Vinyl acetate	1.30E-02	mg/kg		1.83E+01	NoA
1	5	Vinyl chloride	1.30E-02	mg/kg		8.24E-02	NoA
99	1	1,1,1-Trichloroethane	5.00E-03	mg/kg		1.46E+02	NoA
99	1	Acenaphthene	4.80E-01	mg/kg		1.17E+02	NoA
99	1	Acenaphthylene	4.80E-01	mg/kg			NoC
99	1	Anthracene	4.80E-01	mg/kg		7.47E+02	NoA
99	1	Antimony	9.72E+00	mg/kg	2.10E-01	5.52E-01	Yes
99	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
99	1	Benzo(ghi)perylene	4.80E-01	mg/kg			NoC
99	1	Beryllium	4.86E-01	mg/kg	6.70E-01	5.67E-03	NoB
99	1	Cadmium	1.94E+00	mg/kg	2.10E-01	8.11E-01	Yes
99	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
99	1	Fluoranthene	4.80E-01	mg/kg		1.09E+02	NoA
99	1	Fluorene	4.80E-01	mg/kg		9.15E+01	NoA
99	1	Lead	1.94E+01	mg/kg	3.60E+01	4.00E+02	NoAB

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
99	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
99	1	Naphthalene	4.80E-01	mg/kg		1.15E+00	NoA
99	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
99	1	Phenanthrene	4.80E-01	mg/kg			NoC
99	1	Pyrene	4.80E-01	mg/kg		8.12E+01	NoA
99	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
99	1	Sodium	9.72E+01	mg/kg	3.20E+02		NoBE
99	1	Thallium	1.94E+01	mg/kg	2.10E-01	3.68E-01	Yes
99	1	Total PAH	4.80E-01	mg/kg		1.97E-02	Yes
99	1	Trichloroethene	5.00E-03	mg/kg		2.34E-02	NoA
99	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	1	1,2,4-Trichlorobenzene	4.30E-01	mg/kg		7.86E-01	NoA
194	1	1,2-Dichlorobenzene	4.30E-01	mg/kg		2.92E+01	NoA
194	1	1,3-Dichlorobenzene	4.30E-01	mg/kg			NoC
194	1	1,4-Dichlorobenzene	4.30E-01	mg/kg		8.13E-01	NoA
194	1	2,4,5-Trichlorophenol	4.30E-01	mg/kg		3.26E+02	NoA
194	1	2,4,6-Trichlorophenol	4.30E-01	mg/kg		3.26E+00	NoA
194	1	2,4-Dichlorophenol	4.30E-01	mg/kg		9.78E+00	NoA
194	1	2,4-Dimethylphenol	4.30E-01	mg/kg		6.52E+01	NoA
194	1	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
194	1	2,4-Dinitrotoluene	4.30E-01	mg/kg		5.63E-01	NoA
194	1	2,6-Dinitrotoluene	4.30E-01	mg/kg		3.26E+00	NoA
194	1	2-Chloronaphthalene	4.30E-01	mg/kg		6.26E+02	NoA
194	1	2-Chlorophenol	4.30E-01	mg/kg		3.91E+01	NoA
194	1	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
194	1	2-Methylnaphthalene	4.30E-01	mg/kg		1.30E+01	NoA
194	1	2-Methylphenol	4.30E-01	mg/kg		1.54E+02	NoA
194	1	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
194	1	2-Nitrophenol	4.30E-01	mg/kg			NoC
194	1	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
194	1	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
194	1	4-Bromophenyl phenyl ether	4.30E-01	mg/kg			NoC
194	1	4-Chloro-3-methylphenol	4.30E-01	mg/kg			NoC
194	1	4-Chlorobenzenamine	4.30E-01	mg/kg		8.66E-01	NoA
194	1	4-Chlorophenyl phenyl ether	4.30E-01	mg/kg			NoC
194	1	4-Nitrophenol	2.10E+00	mg/kg			NoC
194	1	Acenaphthene	4.30E-01	mg/kg		1.17E+02	NoA
194	1	Acenaphthylene	4.30E-01	mg/kg			NoC
194	1	Anthracene	4.30E-01	mg/kg		7.47E+02	NoA
194	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	1	Benzenemethanol	4.30E-01	mg/kg		3.26E+02	NoA
194	1	Benzo(ghi)perylene	4.30E-01	mg/kg			NoC
194	1	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
194	1	Bis(2-chloroethoxy)methane	4.30E-01	mg/kg		9.78E+00	NoA
194	1	Bis(2-chloroethyl) ether	8.50E-03	mg/kg		2.14E-01	NoA
194	1	Bis(2-chloroisopropyl) ether	4.30E-01	mg/kg		4.57E+00	NoA
194	1	Bis(2-ethylhexyl)phthalate	4.30E-01	mg/kg		1.25E+01	NoA
194	1	Butyl benzyl phthalate	4.30E-01	mg/kg		9.18E+01	NoA
194	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	1	Dibenzofuran	4.30E-01	mg/kg		3.26E+00	NoA
194	1	Diethyl phthalate	4.30E-01	mg/kg		2.61E+03	NoA
194	1	Dimethyl phthalate	4.30E-01	mg/kg			NoC
194	1	Di-n-butyl phthalate	4.30E-01	mg/kg		3.26E+02	NoA
194	1	Di-n-octylphthalate	4.30E-01	mg/kg		1.30E+02	NoA
194	1	Fluoranthene	4.30E-01	mg/kg		1.09E+02	NoA
194	1	Fluorene	4.30E-01	mg/kg		9.15E+01	NoA
194	1	Hexachlorobenzene	4.30E-01	mg/kg		4.92E-02	Yes
194	1	Hexachlorobutadiene	4.30E-01	mg/kg		2.22E+00	NoA
194	1	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
194	1	Hexachloroethane	4.30E-01	mg/kg		2.28E+00	NoA
194	1	Isophorone	4.30E-01	mg/kg		1.82E+02	NoA
194	1	m,p-Cresol	8.50E-01	mg/kg		3.91E+01	NoA
194	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	1	Naphthalene	4.30E-01	mg/kg		1.15E+00	NoA
194	1	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
194	1	N-Nitroso-di-n-propylamine	8.50E-03	mg/kg		1.89E-02	NoA
194	1	N-Nitrosodiphenylamine	4.30E-01	mg/kg		3.22E+01	NoA
194	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	1	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
194	1	Phenanthrene	4.30E-01	mg/kg			NoC
194	1	Phenol	4.30E-01	mg/kg		4.98E+02	NoA
194	1	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
194	1	Pyrene	4.30E-01	mg/kg		8.12E+01	NoA
194	1	Pyridine	8.50E-01	mg/kg		7.82E+00	NoA
194	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	1	Thallium	2.60E-01	mg/kg	2.10E-01	3.68E-01	NoA
194	1	Total PAH	8.50E-03	mg/kg		1.97E-02	NoA
194	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	2	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
194	2	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
194	2	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
194	2	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
194	2	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
194	2	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
194	2	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
194	2	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
194	2	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	2	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
194	2	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
194	2	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
194	2	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
194	2	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	2	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
194	2	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
194	2	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	2	2-Nitrophenol	3.90E-01	mg/kg			NoC
194	2	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	2	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	2	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	2	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
194	2	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
194	2	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	2	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	2	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
194	2	Acenaphthylene	3.90E-01	mg/kg			NoC
194	2	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
194	2	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	2	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
194	2	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC
194	2	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	2	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
194	2	Bis(2-chloroethyl) ether	7.90E-03	mg/kg		2.14E-01	NoA
194	2	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
194	2	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
194	2	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
194	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	2	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
194	2	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
194	2	Dimethyl phthalate	3.90E-01	mg/kg			NoC
194	2	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
194	2	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
194	2	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
194	2	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
194	2	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
194	2	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
194	2	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	2	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
194	2	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
194	2	m,p-Cresol	7.90E-01	mg/kg		3.91E+01	NoA
194	2	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	2	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
194	2	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	2	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	2	N-Nitroso-di-n-propylamine	7.90E-03	mg/kg		1.89E-02	NoA
194	2	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
194	2	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	2	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	2	Phenanthrene	3.90E-01	mg/kg			NoC
194	2	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
194	2	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	2	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
194	2	Pyridine	7.90E-01	mg/kg		7.82E+00	NoA
194	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	2	Thallium	2.40E-01	mg/kg	2.10E-01	3.68E-01	NoA
194	2	Total PAH	7.90E-03	mg/kg		1.97E-02	NoA
194	3	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	3	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
194	3	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
194	3	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
194	3	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
194	3	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
194	3	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
194	3	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
194	3	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	3	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
194	3	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
194	3	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
194	3	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
194	3	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	3	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
194	3	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
194	3	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	3	2-Nitrophenol	4.10E-01	mg/kg			NoC
194	3	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	3	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	3	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	3	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
194	3	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
194	3	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	3	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	3	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
194	3	Acenaphthylene	4.10E-01	mg/kg			NoC
194	3	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
194	3	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
194	3	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
194	3	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	3	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
194	3	Bis(2-chloroethyl) ether	8.20E-03	mg/kg		2.14E-01	NoA
194	3	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
194	3	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
194	3	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
194	3	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	3	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
194	3	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
194	3	Dimethyl phthalate	4.10E-01	mg/kg			NoC
194	3	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
194	3	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
194	3	Fluoranthene	4.10E-01	mg/kg		1.09E+02	NoA
194	3	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
194	3	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
194	3	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
194	3	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	3	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
194	3	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
194	3	m,p-Cresol	8.20E-01	mg/kg		3.91E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	3	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	3	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	3	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
194	3	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	3	N-Nitroso-di-n-propylamine	8.20E-03	mg/kg		1.89E-02	NoA
194	3	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
194	3	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	3	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	3	Phenanthrene	4.10E-01	mg/kg			NoC
194	3	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
194	3	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	3	Pyrene	4.10E-01	mg/kg		8.12E+01	NoA
194	3	Pyridine	8.20E-01	mg/kg		7.82E+00	NoA
194	3	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	3	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	3	Thallium	2.40E-01	mg/kg	2.10E-01	3.68E-01	NoA
194	3	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	4	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
194	4	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
194	4	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
194	4	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
194	4	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
194	4	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
194	4	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
194	4	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
194	4	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	4	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
194	4	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
194	4	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
194	4	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
194	4	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	4	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
194	4	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
194	4	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	4	2-Nitrophenol	4.10E-01	mg/kg			NoC
194	4	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	4	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	4	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	4	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
194	4	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
194	4	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	4	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	4	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
194	4	Acenaphthylene	4.10E-01	mg/kg			NoC
194	4	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
194	4	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	4	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
194	4	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
194	4	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	4	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
194	4	Bis(2-chloroethyl) ether	8.20E-03	mg/kg		2.14E-01	NoA
194	4	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
194	4	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
194	4	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
194	4	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	4	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
194	4	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
194	4	Dimethyl phthalate	4.10E-01	mg/kg			NoC
194	4	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
194	4	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
194	4	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
194	4	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
194	4	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
194	4	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	4	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
194	4	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
194	4	m,p-Cresol	8.20E-01	mg/kg		3.91E+01	NoA
194	4	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	4	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
194	4	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	4	N-Nitroso-di-n-propylamine	8.20E-03	mg/kg		1.89E-02	NoA
194	4	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
194	4	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	4	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	4	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
194	4	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	4	Pyridine	8.20E-01	mg/kg		7.82E+00	NoA
194	4	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	4	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	5	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
194	5	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
194	5	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
194	5	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
194	5	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
194	5	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
194	5	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
194	5	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
194	5	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	5	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
194	5	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
194	5	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
194	5	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
194	5	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	5	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
194	5	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
194	5	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	5	2-Nitrophenol	4.10E-01	mg/kg			NoC
194	5	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	5	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	5	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	5	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
194	5	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
194	5	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	5	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	5	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
194	5	Acenaphthylene	4.10E-01	mg/kg			NoC
194	5	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
194	5	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	5	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
194	5	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
194	5	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	5	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
194	5	Bis(2-chloroethyl) ether	8.10E-03	mg/kg		2.14E-01	NoA
194	5	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
194	5	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
194	5	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
194	5	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	5	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
194	5	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
194	5	Dimethyl phthalate	4.10E-01	mg/kg			NoC
194	5	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
194	5	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
194	5	Fluoranthene	4.10E-01	mg/kg		1.09E+02	NoA
194	5	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
194	5	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
194	5	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
194	5	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	5	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
194	5	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
194	5	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	5	m,p-Cresol	8.10E-01	mg/kg		3.91E+01	NoA
194	5	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	5	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
194	5	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	5	N-Nitroso-di-n-propylamine	8.10E-03	mg/kg		1.89E-02	NoA
194	5	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
194	5	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	5	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	5	Phenanthrene	4.10E-01	mg/kg			NoC
194	5	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
194	5	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	5	Pyrene	4.10E-01	mg/kg		8.12E+01	NoA
194	5	Pyridine	8.10E-01	mg/kg		7.82E+00	NoA
194	5	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	5	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	6	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
194	6	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	6	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
194	6	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
194	6	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
194	6	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
194	6	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
194	6	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
194	6	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	6	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
194	6	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
194	6	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
194	6	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
194	6	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	6	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
194	6	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
194	6	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	6	2-Nitrophenol	3.90E-01	mg/kg			NoC
194	6	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	6	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	6	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	6	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
194	6	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
194	6	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	6	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	6	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
194	6	Acenaphthylene	3.90E-01	mg/kg			NoC
194	6	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
194	6	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	6	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
194	6	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC
194	6	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	6	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
194	6	Bis(2-chloroethyl) ether	7.80E-03	mg/kg		2.14E-01	NoA
194	6	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
194	6	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
194	6	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
194	6	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	6	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
194	6	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
194	6	Dimethyl phthalate	3.90E-01	mg/kg			NoC
194	6	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
194	6	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
194	6	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
194	6	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
194	6	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
194	6	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
194	6	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	6	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
194	6	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
194	6	m,p-Cresol	7.80E-01	mg/kg		3.91E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	6	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	6	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	6	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
194	6	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	6	N-Nitroso-di-n-propylamine	7.80E-03	mg/kg		1.89E-02	NoA
194	6	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
194	6	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	6	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	6	Phenanthrene	3.90E-01	mg/kg			NoC
194	6	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
194	6	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	6	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
194	6	Pyridine	7.80E-01	mg/kg		7.82E+00	NoA
194	6	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	6	Thallium	2.40E-01	mg/kg	2.10E-01	3.68E-01	NoA
194	6	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	7	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
194	7	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
194	7	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
194	7	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
194	7	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
194	7	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
194	7	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
194	7	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
194	7	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	7	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
194	7	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
194	7	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
194	7	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
194	7	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	7	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
194	7	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
194	7	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	7	2-Nitrophenol	3.80E-01	mg/kg			NoC
194	7	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	7	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	7	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
194	7	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
194	7	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
194	7	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
194	7	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	7	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
194	7	Acenaphthylene	3.80E-01	mg/kg			NoC
194	7	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
194	7	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	7	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
194	7	Benzo(ghi)perylene	3.80E-01	mg/kg			NoC
194	7	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	7	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	7	Bis(2-chloroethyl) ether	7.70E-03	mg/kg		2.14E-01	NoA
194	7	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
194	7	Bis(2-ethylhexyl)phthalate	3.80E-01	mg/kg		1.25E+01	NoA
194	7	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
194	7	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	7	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
194	7	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
194	7	Dimethyl phthalate	3.80E-01	mg/kg			NoC
194	7	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
194	7	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
194	7	Fluoranthene	3.80E-01	mg/kg		1.09E+02	NoA
194	7	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
194	7	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
194	7	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
194	7	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	7	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
194	7	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
194	7	m,p-Cresol	7.70E-01	mg/kg		3.91E+01	NoA
194	7	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	7	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	7	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
194	7	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	7	N-Nitroso-di-n-propylamine	7.70E-03	mg/kg		1.89E-02	NoA
194	7	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
194	7	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	7	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	7	Phenanthrene	3.80E-01	mg/kg			NoC
194	7	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
194	7	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	7	Pyrene	3.80E-01	mg/kg		8.12E+01	NoA
194	7	Pyridine	7.70E-01	mg/kg		7.82E+00	NoA
194	7	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	7	Total PAH	7.70E-03	mg/kg		1.97E-02	NoA
194	7	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	8	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
194	8	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
194	8	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
194	8	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
194	8	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
194	8	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
194	8	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
194	8	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
194	8	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	8	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
194	8	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
194	8	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
194	8	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
194	8	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	8	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	8	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
194	8	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	8	2-Nitrophenol	4.20E-01	mg/kg			NoC
194	8	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	8	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	8	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
194	8	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
194	8	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
194	8	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
194	8	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	8	Acenaphthylene	4.20E-01	mg/kg			NoC
194	8	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	8	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
194	8	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	8	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
194	8	Bis(2-chloroethyl) ether	8.40E-03	mg/kg		2.14E-01	NoA
194	8	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
194	8	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
194	8	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	8	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
194	8	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
194	8	Dimethyl phthalate	4.20E-01	mg/kg			NoC
194	8	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
194	8	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
194	8	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	8	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
194	8	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
194	8	m,p-Cresol	8.40E-01	mg/kg		3.91E+01	NoA
194	8	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	8	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	8	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
194	8	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	8	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	8	N-Nitroso-di-n-propylamine	8.40E-03	mg/kg		1.89E-02	NoA
194	8	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
194	8	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	8	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	8	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
194	8	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	8	Pyridine	8.40E-01	mg/kg		7.82E+00	NoA
194	8	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	8	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	8	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	9	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
194	9	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
194	9	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
194	9	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
194	9	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
194	9	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	9	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
194	9	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
194	9	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	9	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
194	9	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
194	9	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
194	9	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
194	9	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	9	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
194	9	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
194	9	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	9	2-Nitrophenol	4.20E-01	mg/kg			NoC
194	9	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	9	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	9	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
194	9	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
194	9	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
194	9	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
194	9	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	9	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
194	9	Acenaphthylene	4.20E-01	mg/kg			NoC
194	9	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
194	9	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
194	9	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
194	9	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	9	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
194	9	Bis(2-chloroethyl) ether	8.40E-03	mg/kg		2.14E-01	NoA
194	9	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
194	9	Bis(2-ethylhexyl)phthalate	4.20E-01	mg/kg		1.25E+01	NoA
194	9	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
194	9	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	9	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
194	9	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
194	9	Dimethyl phthalate	4.20E-01	mg/kg			NoC
194	9	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
194	9	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
194	9	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
194	9	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
194	9	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
194	9	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
194	9	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	9	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
194	9	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
194	9	m,p-Cresol	8.40E-01	mg/kg		3.91E+01	NoA
194	9	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	9	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	9	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
194	9	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	9	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	9	N-Nitroso-di-n-propylamine	8.40E-03	mg/kg		1.89E-02	NoA
194	9	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
194	9	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	9	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	9	Phenanthrene	4.20E-01	mg/kg			NoC
194	9	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
194	9	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	9	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
194	9	Pyridine	8.40E-01	mg/kg		7.82E+00	NoA
194	9	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	9	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	9	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	10	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
194	10	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
194	10	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
194	10	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
194	10	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
194	10	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
194	10	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
194	10	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
194	10	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	10	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
194	10	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
194	10	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
194	10	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
194	10	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	10	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
194	10	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
194	10	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	10	2-Nitrophenol	3.80E-01	mg/kg			NoC
194	10	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	10	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	10	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
194	10	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
194	10	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
194	10	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
194	10	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	10	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
194	10	Acenaphthylene	3.80E-01	mg/kg			NoC
194	10	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
194	10	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
194	10	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	10	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
194	10	Bis(2-chloroethyl) ether	7.70E-03	mg/kg		2.14E-01	NoA
194	10	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
194	10	Bis(2-ethylhexyl)phthalate	3.80E-01	mg/kg		1.25E+01	NoA
194	10	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
194	10	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	10	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	10	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
194	10	Dimethyl phthalate	3.80E-01	mg/kg			NoC
194	10	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
194	10	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
194	10	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
194	10	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
194	10	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
194	10	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	10	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
194	10	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
194	10	m,p-Cresol	7.70E-01	mg/kg		3.91E+01	NoA
194	10	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	10	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	10	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
194	10	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	10	N-Nitroso-di-n-propylamine	7.70E-03	mg/kg		1.89E-02	NoA
194	10	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
194	10	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	10	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	10	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
194	10	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	10	Pyridine	7.70E-01	mg/kg		7.82E+00	NoA
194	10	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	10	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	10	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	11	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
194	11	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
194	11	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
194	11	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
194	11	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
194	11	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
194	11	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
194	11	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
194	11	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
194	11	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
194	11	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
194	11	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
194	11	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
194	11	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
194	11	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
194	11	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
194	11	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
194	11	2-Nitrophenol	3.60E-01	mg/kg			NoC
194	11	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
194	11	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
194	11	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
194	11	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
194	11	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
194	11	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	11	4-Nitrophenol	1.70E+00	mg/kg			NoC
194	11	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
194	11	Acenaphthylene	3.60E-01	mg/kg			NoC
194	11	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
194	11	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	11	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
194	11	Benzo(ghi)perylene	3.60E-01	mg/kg			NoC
194	11	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
194	11	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
194	11	Bis(2-chloroethyl) ether	7.20E-03	mg/kg		2.14E-01	NoA
194	11	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
194	11	Bis(2-ethylhexyl)phthalate	3.60E-01	mg/kg		1.25E+01	NoA
194	11	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
194	11	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	11	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
194	11	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
194	11	Dimethyl phthalate	3.60E-01	mg/kg			NoC
194	11	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
194	11	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
194	11	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
194	11	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
194	11	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
194	11	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
194	11	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
194	11	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
194	11	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	11	m,p-Cresol	7.20E-01	mg/kg		3.91E+01	NoA
194	11	Manganese	8.50E+01	mg/kg	1.50E+03	4.19E+02	NoAB
194	11	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	11	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
194	11	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
194	11	N-Nitroso-di-n-propylamine	7.20E-03	mg/kg		1.89E-02	NoA
194	11	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
194	11	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
194	11	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
194	11	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
194	11	Pyridine	7.20E-01	mg/kg		7.82E+00	NoA
194	11	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	11	Thallium	2.20E-01	mg/kg	2.10E-01	3.68E-01	NoA
194	11	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	12	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
194	12	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
194	12	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
194	12	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
194	12	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
194	12	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
194	12	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
194	12	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
194	12	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	12	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
194	12	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
194	12	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
194	12	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
194	12	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
194	12	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
194	12	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
194	12	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
194	12	2-Nitrophenol	3.50E-01	mg/kg			NoC
194	12	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
194	12	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
194	12	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
194	12	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
194	12	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
194	12	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
194	12	4-Nitrophenol	1.70E+00	mg/kg			NoC
194	12	Acenaphthylene	3.50E-01	mg/kg			NoC
194	12	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	12	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
194	12	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
194	12	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
194	12	Bis(2-chloroethyl) ether	7.00E-03	mg/kg		2.14E-01	NoA
194	12	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
194	12	Bis(2-ethylhexyl)phthalate	3.50E-01	mg/kg		1.25E+01	NoA
194	12	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
194	12	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	12	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
194	12	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
194	12	Dimethyl phthalate	3.50E-01	mg/kg			NoC
194	12	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
194	12	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
194	12	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
194	12	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
194	12	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
194	12	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
194	12	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
194	12	m,p-Cresol	7.00E-01	mg/kg		3.91E+01	NoA
194	12	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	12	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	12	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
194	12	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
194	12	N-Nitroso-di-n-propylamine	7.00E-03	mg/kg		1.89E-02	NoA
194	12	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
194	12	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	12	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
194	12	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
194	12	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
194	12	Pyridine	7.00E-01	mg/kg		7.82E+00	NoA
194	12	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	12	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	13	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
194	13	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA
194	13	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
194	13	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
194	13	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
194	13	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
194	13	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
194	13	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
194	13	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	13	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
194	13	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA
194	13	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
194	13	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
194	13	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	13	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
194	13	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
194	13	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	13	2-Nitrophenol	4.00E-01	mg/kg			NoC
194	13	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	13	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	13	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	13	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
194	13	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
194	13	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	13	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	13	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
194	13	Acenaphthylene	4.00E-01	mg/kg			NoC
194	13	Anthracene	4.00E-01	mg/kg		7.47E+02	NoA
194	13	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	13	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
194	13	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
194	13	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	13	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA
194	13	Bis(2-chloroethyl) ether	7.90E-03	mg/kg		2.14E-01	NoA
194	13	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
194	13	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
194	13	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	13	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
194	13	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
194	13	Dimethyl phthalate	4.00E-01	mg/kg			NoC
194	13	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
194	13	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
194	13	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
194	13	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
194	13	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
194	13	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	13	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
194	13	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	13	m,p-Cresol	7.90E-01	mg/kg		3.91E+01	NoA
194	13	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	13	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	13	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
194	13	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	13	N-Nitroso-di-n-propylamine	7.90E-03	mg/kg		1.89E-02	NoA
194	13	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
194	13	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	13	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	13	Phenanthrene	4.00E-01	mg/kg			NoC
194	13	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
194	13	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	13	Pyridine	7.90E-01	mg/kg		7.82E+00	NoA
194	13	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	13	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	13	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	14	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
194	14	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA
194	14	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
194	14	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
194	14	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
194	14	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
194	14	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
194	14	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
194	14	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	14	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
194	14	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA
194	14	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
194	14	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
194	14	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	14	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
194	14	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
194	14	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	14	2-Nitrophenol	4.00E-01	mg/kg			NoC
194	14	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	14	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	14	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	14	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
194	14	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
194	14	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	14	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	14	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
194	14	Acenaphthylene	4.00E-01	mg/kg			NoC
194	14	Anthracene	4.00E-01	mg/kg		7.47E+02	NoA
194	14	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	14	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
194	14	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
194	14	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	14	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	14	Bis(2-chloroethyl) ether	8.00E-03	mg/kg		2.14E-01	NoA
194	14	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
194	14	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
194	14	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
194	14	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	14	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
194	14	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
194	14	Dimethyl phthalate	4.00E-01	mg/kg			NoC
194	14	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
194	14	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
194	14	Fluoranthene	4.00E-01	mg/kg		1.09E+02	NoA
194	14	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
194	14	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
194	14	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
194	14	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	14	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
194	14	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA
194	14	m,p-Cresol	8.00E-01	mg/kg		3.91E+01	NoA
194	14	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	14	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
194	14	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	14	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	14	N-Nitroso-di-n-propylamine	8.00E-03	mg/kg		1.89E-02	NoA
194	14	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
194	14	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	14	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	14	Phenanthrene	4.00E-01	mg/kg			NoC
194	14	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
194	14	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	14	Pyrene	4.00E-01	mg/kg		8.12E+01	NoA
194	14	Pyridine	8.00E-01	mg/kg		7.82E+00	NoA
194	14	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	14	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	14	Total PAH	8.00E-03	mg/kg		1.97E-02	NoA
194	14	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	15	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	15	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	15	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	15	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	15	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	15	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	15	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	15	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	15	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	16	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
194	16	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
194	16	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
194	16	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
194	16	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	16	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
194	16	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
194	16	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
194	16	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	16	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
194	16	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
194	16	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
194	16	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
194	16	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	16	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
194	16	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
194	16	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	16	2-Nitrophenol	4.10E-01	mg/kg			NoC
194	16	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	16	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	16	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	16	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
194	16	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
194	16	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	16	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	16	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
194	16	Acenaphthylene	4.10E-01	mg/kg			NoC
194	16	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
194	16	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
194	16	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
194	16	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	16	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
194	16	Bis(2-chloroethyl) ether	8.20E-03	mg/kg		2.14E-01	NoA
194	16	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
194	16	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
194	16	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
194	16	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	16	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
194	16	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
194	16	Dimethyl phthalate	4.10E-01	mg/kg			NoC
194	16	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
194	16	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
194	16	Fluoranthene	4.10E-01	mg/kg		1.09E+02	NoA
194	16	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
194	16	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
194	16	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
194	16	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	16	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
194	16	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
194	16	m,p-Cresol	8.20E-01	mg/kg		3.91E+01	NoA
194	16	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	16	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	16	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
194	16	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	16	N-Nitroso-di-n-propylamine	8.20E-03	mg/kg		1.89E-02	NoA
194	16	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
194	16	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	16	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	16	Phenanthrene	4.10E-01	mg/kg			NoC
194	16	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
194	16	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	16	Pyrene	4.10E-01	mg/kg		8.12E+01	NoA
194	16	Pyridine	8.20E-01	mg/kg		7.82E+00	NoA
194	16	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	16	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	16	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	17	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
194	17	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
194	17	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
194	17	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
194	17	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
194	17	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
194	17	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
194	17	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
194	17	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
194	17	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
194	17	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
194	17	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
194	17	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
194	17	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
194	17	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
194	17	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
194	17	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
194	17	2-Nitrophenol	3.60E-01	mg/kg			NoC
194	17	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
194	17	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
194	17	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
194	17	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
194	17	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
194	17	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
194	17	4-Nitrophenol	1.70E+00	mg/kg			NoC
194	17	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
194	17	Acenaphthylene	3.60E-01	mg/kg			NoC
194	17	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
194	17	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
194	17	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
194	17	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
194	17	Bis(2-chloroethyl) ether	7.20E-03	mg/kg		2.14E-01	NoA
194	17	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
194	17	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
194	17	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	17	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
194	17	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	17	Dimethyl phthalate	3.60E-01	mg/kg			NoC
194	17	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
194	17	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
194	17	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
194	17	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
194	17	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
194	17	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
194	17	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
194	17	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
194	17	m,p-Cresol	7.20E-01	mg/kg		3.91E+01	NoA
194	17	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	17	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	17	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
194	17	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	17	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
194	17	N-Nitroso-di-n-propylamine	7.20E-03	mg/kg		1.89E-02	NoA
194	17	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
194	17	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	17	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
194	17	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
194	17	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
194	17	Pyridine	7.20E-01	mg/kg		7.82E+00	NoA
194	17	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	17	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	17	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	18	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
194	18	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA
194	18	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
194	18	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
194	18	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
194	18	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
194	18	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
194	18	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
194	18	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	18	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
194	18	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA
194	18	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
194	18	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
194	18	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	18	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
194	18	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
194	18	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	18	2-Nitrophenol	4.00E-01	mg/kg			NoC
194	18	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	18	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	18	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	18	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
194	18	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
194	18	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	18	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	18	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
194	18	Acenaphthylene	4.00E-01	mg/kg			NoC
194	18	Anthracene	4.00E-01	mg/kg		7.47E+02	NoA
194	18	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
194	18	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
194	18	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	18	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA
194	18	Bis(2-chloroethyl) ether	8.10E-03	mg/kg		2.14E-01	NoA
194	18	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
194	18	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
194	18	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
194	18	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	18	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
194	18	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
194	18	Dimethyl phthalate	4.00E-01	mg/kg			NoC
194	18	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
194	18	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
194	18	Fluoranthene	4.00E-01	mg/kg		1.09E+02	NoA
194	18	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
194	18	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
194	18	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
194	18	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	18	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
194	18	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA
194	18	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	18	m,p-Cresol	8.10E-01	mg/kg		3.91E+01	NoA
194	18	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	18	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	18	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
194	18	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	18	N-Nitroso-di-n-propylamine	8.10E-03	mg/kg		1.89E-02	NoA
194	18	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
194	18	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	18	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	18	Phenanthrene	4.00E-01	mg/kg			NoC
194	18	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
194	18	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	18	Pyrene	4.00E-01	mg/kg		8.12E+01	NoA
194	18	Pyridine	8.10E-01	mg/kg		7.82E+00	NoA
194	18	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	18	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	18	Total PAH	8.10E-03	mg/kg		1.97E-02	NoA
194	18	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	19	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
194	19	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
194	19	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
194	19	1,4-Dichlorobenzene	4.40E-01	mg/kg		8.13E-01	NoA
194	19	2,4,5-Trichlorophenol	4.40E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	19	2,4,6-Trichlorophenol	4.40E-01	mg/kg		3.26E+00	NoA
194	19	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
194	19	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
194	19	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
194	19	2,4-Dinitrotoluene	4.40E-01	mg/kg		5.63E-01	NoA
194	19	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
194	19	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA
194	19	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
194	19	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
194	19	2-Methylnaphthalene	4.40E-01	mg/kg		1.30E+01	NoA
194	19	2-Methylphenol	4.40E-01	mg/kg		1.54E+02	NoA
194	19	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
194	19	2-Nitrophenol	4.40E-01	mg/kg			NoC
194	19	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
194	19	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
194	19	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
194	19	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
194	19	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
194	19	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
194	19	4-Nitrophenol	2.10E+00	mg/kg			NoC
194	19	Acenaphthene	4.40E-01	mg/kg		1.17E+02	NoA
194	19	Acenaphthylene	4.40E-01	mg/kg			NoC
194	19	Anthracene	4.40E-01	mg/kg		7.47E+02	NoA
194	19	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
194	19	Benzo(ghi)perylene	4.40E-01	mg/kg			NoC
194	19	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
194	19	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
194	19	Bis(2-chloroethyl) ether	8.80E-03	mg/kg		2.14E-01	NoA
194	19	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA
194	19	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
194	19	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	19	Dibenzofuran	4.40E-01	mg/kg		3.26E+00	NoA
194	19	Diethyl phthalate	4.40E-01	mg/kg		2.61E+03	NoA
194	19	Dimethyl phthalate	4.40E-01	mg/kg			NoC
194	19	Di-n-butyl phthalate	4.40E-01	mg/kg		3.26E+02	NoA
194	19	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA
194	19	Fluoranthene	4.40E-01	mg/kg		1.09E+02	NoA
194	19	Fluorene	4.40E-01	mg/kg		9.15E+01	NoA
194	19	Hexachlorobenzene	4.40E-01	mg/kg		4.92E-02	Yes
194	19	Hexachlorobutadiene	4.40E-01	mg/kg		2.22E+00	NoA
194	19	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
194	19	Hexachloroethane	4.40E-01	mg/kg		2.28E+00	NoA
194	19	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
194	19	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	19	m,p-Cresol	8.80E-01	mg/kg		3.91E+01	NoA
194	19	Manganese	8.50E+01	mg/kg	1.50E+03	4.19E+02	NoAB
194	19	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	19	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	19	Naphthalene	4.40E-01	mg/kg		1.15E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	19	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
194	19	N-Nitroso-di-n-propylamine	8.80E-03	mg/kg		1.89E-02	NoA
194	19	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
194	19	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	19	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
194	19	Phenanthrene	4.40E-01	mg/kg			NoC
194	19	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
194	19	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
194	19	Pyrene	4.40E-01	mg/kg		8.12E+01	NoA
194	19	Pyridine	8.80E-01	mg/kg		7.82E+00	NoA
194	19	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	19	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	19	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	19	Zinc	2.50E+01	mg/kg	6.50E+01	1.38E+03	NoAB
194	20	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
194	20	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
194	20	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
194	20	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
194	20	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
194	20	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
194	20	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
194	20	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
194	20	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	20	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
194	20	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
194	20	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
194	20	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
194	20	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	20	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
194	20	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
194	20	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	20	2-Nitrophenol	4.20E-01	mg/kg			NoC
194	20	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	20	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	20	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
194	20	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
194	20	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
194	20	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
194	20	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	20	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
194	20	Acenaphthylene	4.20E-01	mg/kg			NoC
194	20	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
194	20	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
194	20	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
194	20	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	20	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
194	20	Bis(2-chloroethyl) ether	8.30E-03	mg/kg		2.14E-01	NoA
194	20	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
194	20	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	20	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	20	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
194	20	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
194	20	Dimethyl phthalate	4.20E-01	mg/kg			NoC
194	20	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
194	20	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
194	20	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
194	20	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
194	20	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
194	20	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
194	20	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	20	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
194	20	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
194	20	m,p-Cresol	8.30E-01	mg/kg		3.91E+01	NoA
194	20	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	20	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
194	20	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	20	N-Nitroso-di-n-propylamine	8.30E-03	mg/kg		1.89E-02	NoA
194	20	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
194	20	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	20	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	20	Phenanthrene	4.20E-01	mg/kg			NoC
194	20	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
194	20	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	20	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
194	20	Pyridine	8.30E-01	mg/kg		7.82E+00	NoA
194	20	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	20	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	21	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
194	21	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
194	21	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
194	21	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
194	21	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
194	21	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
194	21	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
194	21	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
194	21	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	21	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
194	21	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
194	21	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
194	21	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
194	21	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	21	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
194	21	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
194	21	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	21	2-Nitrophenol	3.90E-01	mg/kg			NoC
194	21	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	21	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	21	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	21	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
194	21	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
194	21	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	21	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	21	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
194	21	Acenaphthylene	3.90E-01	mg/kg			NoC
194	21	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
194	21	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	21	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
194	21	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC
194	21	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	21	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
194	21	Bis(2-chloroethyl) ether	7.90E-03	mg/kg		2.14E-01	NoA
194	21	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
194	21	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
194	21	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
194	21	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	21	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
194	21	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
194	21	Dimethyl phthalate	3.90E-01	mg/kg			NoC
194	21	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
194	21	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
194	21	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
194	21	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
194	21	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
194	21	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
194	21	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	21	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
194	21	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
194	21	m,p-Cresol	7.90E-01	mg/kg		3.91E+01	NoA
194	21	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	21	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
194	21	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	21	N-Nitroso-di-n-propylamine	7.90E-03	mg/kg		1.89E-02	NoA
194	21	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
194	21	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	21	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	21	Phenanthrene	3.90E-01	mg/kg			NoC
194	21	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
194	21	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	21	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
194	21	Pyridine	7.90E-01	mg/kg		7.82E+00	NoA
194	21	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	21	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	21	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	22	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
194	22	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
194	22	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
194	22	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	22	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
194	22	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
194	22	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
194	22	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
194	22	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	22	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
194	22	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
194	22	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
194	22	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
194	22	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	22	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
194	22	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
194	22	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	22	2-Nitrophenol	3.80E-01	mg/kg			NoC
194	22	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	22	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	22	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
194	22	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
194	22	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
194	22	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
194	22	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	22	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
194	22	Acenaphthylene	3.80E-01	mg/kg			NoC
194	22	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
194	22	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	22	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
194	22	Benzo(ghi)perylene	3.80E-01	mg/kg			NoC
194	22	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
194	22	Bis(2-chloroethyl) ether	7.70E-03	mg/kg		2.14E-01	NoA
194	22	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
194	22	Bis(2-ethylhexyl)phthalate	3.80E-01	mg/kg		1.25E+01	NoA
194	22	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
194	22	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	22	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
194	22	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
194	22	Dimethyl phthalate	3.80E-01	mg/kg			NoC
194	22	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
194	22	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
194	22	Fluoranthene	3.80E-01	mg/kg		1.09E+02	NoA
194	22	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
194	22	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
194	22	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
194	22	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	22	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
194	22	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
194	22	m,p-Cresol	7.70E-01	mg/kg		3.91E+01	NoA
194	22	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	22	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	22	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	22	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	22	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	22	N-Nitroso-di-n-propylamine	7.70E-03	mg/kg		1.89E-02	NoA
194	22	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
194	22	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	22	Phenanthrene	3.80E-01	mg/kg			NoC
194	22	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
194	22	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	22	Pyrene	3.80E-01	mg/kg		8.12E+01	NoA
194	22	Pyridine	7.70E-01	mg/kg		7.82E+00	NoA
194	22	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	22	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	22	Total PAH	7.70E-03	mg/kg		1.97E-02	NoA
194	22	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	23	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
194	23	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
194	23	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
194	23	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
194	23	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
194	23	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
194	23	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
194	23	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
194	23	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	23	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
194	23	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
194	23	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
194	23	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
194	23	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	23	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
194	23	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
194	23	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	23	2-Nitrophenol	4.10E-01	mg/kg			NoC
194	23	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	23	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	23	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	23	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
194	23	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
194	23	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	23	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	23	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
194	23	Acenaphthylene	4.10E-01	mg/kg			NoC
194	23	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
194	23	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
194	23	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
194	23	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	23	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
194	23	Bis(2-chloroethyl) ether	8.10E-03	mg/kg		2.14E-01	NoA
194	23	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
194	23	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	23	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
194	23	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	23	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
194	23	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
194	23	Dimethyl phthalate	4.10E-01	mg/kg			NoC
194	23	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
194	23	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
194	23	Fluoranthene	4.10E-01	mg/kg		1.09E+02	NoA
194	23	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
194	23	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
194	23	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
194	23	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	23	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
194	23	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
194	23	m,p-Cresol	8.10E-01	mg/kg		3.91E+01	NoA
194	23	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	23	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	23	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
194	23	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	23	N-Nitroso-di-n-propylamine	8.10E-03	mg/kg		1.89E-02	NoA
194	23	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
194	23	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	23	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	23	Phenanthrene	4.10E-01	mg/kg			NoC
194	23	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
194	23	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	23	Pyrene	4.10E-01	mg/kg		8.12E+01	NoA
194	23	Pyridine	8.10E-01	mg/kg		7.82E+00	NoA
194	23	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	23	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	24	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
194	24	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
194	24	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
194	24	1,4-Dichlorobenzene	4.40E-01	mg/kg		8.13E-01	NoA
194	24	2,4,5-Trichlorophenol	4.40E-01	mg/kg		3.26E+02	NoA
194	24	2,4,6-Trichlorophenol	4.40E-01	mg/kg		3.26E+00	NoA
194	24	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
194	24	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
194	24	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
194	24	2,4-Dinitrotoluene	4.40E-01	mg/kg		5.63E-01	NoA
194	24	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
194	24	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA
194	24	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
194	24	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
194	24	2-Methylnaphthalene	4.40E-01	mg/kg		1.30E+01	NoA
194	24	2-Methylphenol	4.40E-01	mg/kg		1.54E+02	NoA
194	24	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
194	24	2-Nitrophenol	4.40E-01	mg/kg			NoC
194	24	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	24	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
194	24	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
194	24	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
194	24	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
194	24	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
194	24	4-Nitrophenol	2.10E+00	mg/kg			NoC
194	24	Acenaphthene	4.40E-01	mg/kg		1.17E+02	NoA
194	24	Acenaphthylene	4.40E-01	mg/kg			NoC
194	24	Anthracene	4.40E-01	mg/kg		7.47E+02	NoA
194	24	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	24	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
194	24	Benzo(ghi)perylene	4.40E-01	mg/kg			NoC
194	24	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
194	24	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
194	24	Bis(2-chloroethyl) ether	8.70E-03	mg/kg		2.14E-01	NoA
194	24	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA
194	24	Bis(2-ethylhexyl)phthalate	4.40E-01	mg/kg		1.25E+01	NoA
194	24	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
194	24	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	24	Dibenzofuran	4.40E-01	mg/kg		3.26E+00	NoA
194	24	Diethyl phthalate	4.40E-01	mg/kg		2.61E+03	NoA
194	24	Dimethyl phthalate	4.40E-01	mg/kg			NoC
194	24	Di-n-butyl phthalate	4.40E-01	mg/kg		3.26E+02	NoA
194	24	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA
194	24	Fluoranthene	4.40E-01	mg/kg		1.09E+02	NoA
194	24	Fluorene	4.40E-01	mg/kg		9.15E+01	NoA
194	24	Hexachlorobenzene	4.40E-01	mg/kg		4.92E-02	Yes
194	24	Hexachlorobutadiene	4.40E-01	mg/kg		2.22E+00	NoA
194	24	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
194	24	Hexachloroethane	4.40E-01	mg/kg		2.28E+00	NoA
194	24	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
194	24	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	24	m,p-Cresol	8.70E-01	mg/kg		3.91E+01	NoA
194	24	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	24	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	24	Naphthalene	4.40E-01	mg/kg		1.15E+00	NoA
194	24	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
194	24	N-Nitroso-di-n-propylamine	8.70E-03	mg/kg		1.89E-02	NoA
194	24	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
194	24	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	24	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
194	24	Phenanthrene	4.40E-01	mg/kg			NoC
194	24	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
194	24	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
194	24	Pyrene	4.40E-01	mg/kg		8.12E+01	NoA
194	24	Pyridine	8.70E-01	mg/kg		7.82E+00	NoA
194	24	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	24	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	24	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	25	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
194	25	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
194	25	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
194	25	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
194	25	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
194	25	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
194	25	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
194	25	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
194	25	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	25	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
194	25	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
194	25	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
194	25	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
194	25	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	25	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
194	25	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
194	25	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	25	2-Nitrophenol	4.10E-01	mg/kg			NoC
194	25	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	25	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	25	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	25	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
194	25	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
194	25	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
194	25	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	25	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
194	25	Acenaphthylene	4.10E-01	mg/kg			NoC
194	25	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
194	25	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	25	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
194	25	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
194	25	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	25	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
194	25	Bis(2-chloroethyl) ether	8.10E-03	mg/kg		2.14E-01	NoA
194	25	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
194	25	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
194	25	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
194	25	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	25	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
194	25	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
194	25	Dimethyl phthalate	4.10E-01	mg/kg			NoC
194	25	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
194	25	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
194	25	Fluoranthene	4.10E-01	mg/kg		1.09E+02	NoA
194	25	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
194	25	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
194	25	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
194	25	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	25	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	25	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
194	25	m,p-Cresol	8.10E-01	mg/kg		3.91E+01	NoA
194	25	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	25	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	25	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
194	25	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	25	N-Nitroso-di-n-propylamine	8.10E-03	mg/kg		1.89E-02	NoA
194	25	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
194	25	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	25	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	25	Phenanthrene	4.10E-01	mg/kg			NoC
194	25	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
194	25	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	25	Pyrene	4.10E-01	mg/kg		8.12E+01	NoA
194	25	Pyridine	8.10E-01	mg/kg		7.82E+00	NoA
194	25	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	25	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
194	25	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	26	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
194	26	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
194	26	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
194	26	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
194	26	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
194	26	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
194	26	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
194	26	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
194	26	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	26	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
194	26	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
194	26	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
194	26	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
194	26	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	26	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
194	26	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
194	26	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	26	2-Nitrophenol	3.90E-01	mg/kg			NoC
194	26	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	26	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	26	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	26	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
194	26	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
194	26	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	26	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	26	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
194	26	Acenaphthylene	3.90E-01	mg/kg			NoC
194	26	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
194	26	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	26	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
194	26	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	26	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	26	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
194	26	Bis(2-chloroethyl) ether	7.80E-03	mg/kg		2.14E-01	NoA
194	26	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
194	26	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
194	26	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
194	26	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	26	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
194	26	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
194	26	Dimethyl phthalate	3.90E-01	mg/kg			NoC
194	26	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
194	26	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
194	26	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
194	26	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
194	26	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
194	26	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
194	26	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	26	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
194	26	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
194	26	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	26	m,p-Cresol	7.80E-01	mg/kg		3.91E+01	NoA
194	26	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	26	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	26	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
194	26	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
194	26	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	26	N-Nitroso-di-n-propylamine	7.80E-03	mg/kg		1.89E-02	NoA
194	26	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
194	26	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	26	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	26	Phenanthrene	3.90E-01	mg/kg			NoC
194	26	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
194	26	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	26	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
194	26	Pyridine	7.80E-01	mg/kg		7.82E+00	NoA
194	26	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	26	Total PAH	7.80E-03	mg/kg		1.97E-02	NoA
194	26	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	27	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
194	27	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA
194	27	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
194	27	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
194	27	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
194	27	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
194	27	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
194	27	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
194	27	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
194	27	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
194	27	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	27	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
194	27	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
194	27	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	27	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
194	27	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
194	27	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	27	2-Nitrophenol	4.00E-01	mg/kg			NoC
194	27	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	27	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	27	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	27	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
194	27	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
194	27	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	27	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	27	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
194	27	Acenaphthylene	4.00E-01	mg/kg			NoC
194	27	Anthracene	4.00E-01	mg/kg		7.47E+02	NoA
194	27	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	27	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
194	27	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
194	27	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	27	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA
194	27	Bis(2-chloroethyl) ether	8.10E-03	mg/kg		2.14E-01	NoA
194	27	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
194	27	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
194	27	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
194	27	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	27	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
194	27	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
194	27	Dimethyl phthalate	4.00E-01	mg/kg			NoC
194	27	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
194	27	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
194	27	Fluoranthene	4.00E-01	mg/kg		1.09E+02	NoA
194	27	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
194	27	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
194	27	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
194	27	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	27	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
194	27	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA
194	27	m,p-Cresol	8.10E-01	mg/kg		3.91E+01	NoA
194	27	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	27	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	27	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
194	27	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	27	N-Nitroso-di-n-propylamine	8.10E-03	mg/kg		1.89E-02	NoA
194	27	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
194	27	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	27	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
194	27	Phenanthrene	4.00E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	27	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
194	27	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	27	Pyrene	4.00E-01	mg/kg		8.12E+01	NoA
194	27	Pyridine	8.10E-01	mg/kg		7.82E+00	NoA
194	27	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	27	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	28	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
194	28	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
194	28	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
194	28	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
194	28	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
194	28	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
194	28	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
194	28	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
194	28	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
194	28	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
194	28	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
194	28	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
194	28	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
194	28	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
194	28	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
194	28	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
194	28	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
194	28	2-Nitrophenol	3.90E-01	mg/kg			NoC
194	28	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
194	28	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
194	28	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	28	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
194	28	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
194	28	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
194	28	4-Nitrophenol	1.90E+00	mg/kg			NoC
194	28	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
194	28	Acenaphthylene	3.90E-01	mg/kg			NoC
194	28	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
194	28	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
194	28	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC
194	28	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
194	28	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
194	28	Bis(2-chloroethyl) ether	7.70E-03	mg/kg		2.14E-01	NoA
194	28	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
194	28	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
194	28	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
194	28	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	28	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
194	28	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
194	28	Dimethyl phthalate	3.90E-01	mg/kg			NoC
194	28	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
194	28	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
194	28	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	28	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
194	28	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
194	28	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
194	28	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
194	28	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
194	28	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
194	28	m,p-Cresol	7.70E-01	mg/kg		3.91E+01	NoA
194	28	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	28	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	28	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
194	28	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
194	28	N-Nitroso-di-n-propylamine	7.70E-03	mg/kg		1.89E-02	NoA
194	28	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
194	28	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	28	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
194	28	Phenanthrene	3.90E-01	mg/kg			NoC
194	28	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
194	28	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
194	28	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
194	28	Pyridine	7.70E-01	mg/kg		7.82E+00	NoA
194	28	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	28	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	29	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
194	29	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
194	29	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
194	29	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
194	29	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
194	29	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
194	29	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
194	29	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
194	29	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
194	29	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
194	29	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
194	29	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
194	29	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
194	29	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
194	29	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
194	29	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
194	29	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
194	29	2-Nitrophenol	3.70E-01	mg/kg			NoC
194	29	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
194	29	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
194	29	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
194	29	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
194	29	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
194	29	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
194	29	4-Nitrophenol	1.80E+00	mg/kg			NoC
194	29	Acenaphthene	3.70E-01	mg/kg		1.17E+02	NoA
194	29	Acenaphthylene	3.70E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	29	Anthracene	3.70E-01	mg/kg		7.47E+02	NoA
194	29	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	29	Benzenemethanol	3.70E-01	mg/kg		3.26E+02	NoA
194	29	Benzo(ghi)perylene	3.70E-01	mg/kg			NoC
194	29	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
194	29	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
194	29	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
194	29	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
194	29	Bis(2-ethylhexyl)phthalate	3.70E-01	mg/kg		1.25E+01	NoA
194	29	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
194	29	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	29	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
194	29	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
194	29	Dimethyl phthalate	3.70E-01	mg/kg			NoC
194	29	Di-n-butyl phthalate	3.70E-01	mg/kg		3.26E+02	NoA
194	29	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
194	29	Fluoranthene	3.70E-01	mg/kg		1.09E+02	NoA
194	29	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
194	29	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
194	29	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
194	29	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
194	29	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
194	29	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
194	29	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA
194	29	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
194	29	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	29	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
194	29	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
194	29	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
194	29	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
194	29	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	29	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
194	29	Phenanthrene	3.70E-01	mg/kg			NoC
194	29	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
194	29	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
194	29	Pyrene	3.70E-01	mg/kg		8.12E+01	NoA
194	29	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
194	29	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	29	Total PAH	7.30E-03	mg/kg		1.97E-02	NoA
194	29	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	30	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
194	30	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA
194	30	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
194	30	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
194	30	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
194	30	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
194	30	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
194	30	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
194	30	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	30	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
194	30	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA
194	30	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
194	30	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
194	30	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
194	30	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
194	30	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
194	30	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
194	30	2-Nitrophenol	4.00E-01	mg/kg			NoC
194	30	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
194	30	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
194	30	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	30	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
194	30	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
194	30	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC
194	30	4-Nitrophenol	2.00E+00	mg/kg			NoC
194	30	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
194	30	Acenaphthylene	4.00E-01	mg/kg			NoC
194	30	Anthracene	4.00E-01	mg/kg		7.47E+02	NoA
194	30	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
194	30	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
194	30	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
194	30	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
194	30	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA
194	30	Bis(2-chloroethyl) ether	8.10E-03	mg/kg		2.14E-01	NoA
194	30	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
194	30	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
194	30	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
194	30	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
194	30	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
194	30	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
194	30	Dimethyl phthalate	4.00E-01	mg/kg			NoC
194	30	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
194	30	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
194	30	Fluoranthene	4.00E-01	mg/kg		1.09E+02	NoA
194	30	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
194	30	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
194	30	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
194	30	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
194	30	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
194	30	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA
194	30	m,p-Cresol	8.10E-01	mg/kg		3.91E+01	NoA
194	30	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
194	30	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
194	30	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
194	30	N-Nitroso-di-n-propylamine	8.10E-03	mg/kg		1.89E-02	NoA
194	30	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
194	30	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
194	30	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	30	Phenanthrene	4.00E-01	mg/kg			NoC
194	30	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
194	30	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
194	30	Pyrene	4.00E-01	mg/kg		8.12E+01	NoA
194	30	Pyridine	8.10E-01	mg/kg		7.82E+00	NoA
194	30	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
194	30	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
194	31	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
194	31	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
194	31	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
194	31	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
194	31	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
194	31	1,2,4-Trichlorobenzene	4.70E-01	mg/kg		7.86E-01	NoA
194	31	1,2-Dichlorobenzene	4.70E-01	mg/kg		2.92E+01	NoA
194	31	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
194	31	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
194	31	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
194	31	1,3-Dichlorobenzene	4.70E-01	mg/kg			NoC
194	31	1,4-Dichlorobenzene	4.70E-01	mg/kg		8.13E-01	NoA
194	31	2,4,5-Trichlorophenol	4.70E-01	mg/kg		3.26E+02	NoA
194	31	2,4,6-Trichlorophenol	4.70E-01	mg/kg		3.26E+00	NoA
194	31	2,4-Dichlorophenol	4.70E-01	mg/kg		9.78E+00	NoA
194	31	2,4-Dimethylphenol	4.70E-01	mg/kg		6.52E+01	NoA
194	31	2,4-Dinitrophenol	4.70E-01	mg/kg		6.52E+00	NoA
194	31	2,4-Dinitrotoluene	4.70E-01	mg/kg		5.63E-01	NoA
194	31	2,6-Dinitrotoluene	4.70E-01	mg/kg		3.26E+00	NoA
194	31	2-Chloronaphthalene	4.70E-01	mg/kg		6.26E+02	NoA
194	31	2-Chlorophenol	4.70E-01	mg/kg		3.91E+01	NoA
194	31	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
194	31	2-Methyl-4,6-dinitrophenol	4.70E-01	mg/kg		2.61E-01	Yes
194	31	2-Methylnaphthalene	4.70E-01	mg/kg		1.30E+01	NoA
194	31	2-Methylphenol	4.70E-01	mg/kg		1.54E+02	NoA
194	31	2-Nitrobenzenamine	4.70E-01	mg/kg		2.96E-01	Yes
194	31	2-Nitrophenol	4.70E-01	mg/kg			NoC
194	31	3,3'-Dichlorobenzidine	4.70E-01	mg/kg		3.85E-01	Yes
194	31	3-Nitrobenzenamine	4.70E-01	mg/kg		9.78E-01	Yes
194	31	4-Bromophenyl phenyl ether	4.70E-01	mg/kg			NoC
194	31	4-Chloro-3-methylphenol	4.70E-01	mg/kg			NoC
194	31	4-Chlorobenzenamine	4.70E-01	mg/kg		8.66E-01	NoA
194	31	4-Chlorophenyl phenyl ether	4.70E-01	mg/kg			NoC
194	31	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
194	31	4-Nitrophenol	4.70E-01	mg/kg			NoC
194	31	Acenaphthene	4.70E-01	mg/kg		1.17E+02	NoA
194	31	Acenaphthylene	4.70E-01	mg/kg			NoC
194	31	Anthracene	4.70E-01	mg/kg		7.47E+02	NoA
194	31	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
194	31	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
194	31	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
194	31	Benzenemethanol	4.70E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	31	Benzo(ghi)perylene	4.70E-01	mg/kg			NoC
194	31	Benzoic acid	4.70E-01	mg/kg		1.30E+04	NoA
194	31	Beryllium	5.00E-01	mg/kg	6.70E-01	5.67E-03	NoB
194	31	Bis(2-chloroethoxy)methane	4.70E-01	mg/kg		9.78E+00	NoA
194	31	Bis(2-chloroethyl) ether	4.70E-01	mg/kg		2.14E-01	Yes
194	31	Bis(2-chloroisopropyl) ether	4.70E-01	mg/kg		4.57E+00	NoA
194	31	Bis(2-ethylhexyl)phthalate	4.70E-01	mg/kg		1.25E+01	NoA
194	31	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
194	31	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
194	31	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
194	31	Butyl benzyl phthalate	4.70E-01	mg/kg		9.18E+01	NoA
194	31	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
194	31	Carbazole	4.70E-01	mg/kg		8.72E+00	NoA
194	31	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
194	31	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
194	31	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
194	31	Chloroethane	1.00E-02	mg/kg		1.45E+03	NoA
194	31	Chloroform	1.00E-02	mg/kg		1.22E-01	NoA
194	31	Chloromethane	1.00E-02	mg/kg		1.65E+00	NoA
194	31	cis-1,2-Dichloroethene	1.00E-02	mg/kg		1.05E+00	NoA
194	31	cis-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
194	31	Dibenzofuran	4.70E-01	mg/kg		3.26E+00	NoA
194	31	Dibromochloromethane	1.00E-02	mg/kg		2.42E-01	NoA
194	31	Diethyl phthalate	4.70E-01	mg/kg		2.61E+03	NoA
194	31	Dimethyl phthalate	4.70E-01	mg/kg			NoC
194	31	Di-n-octylphthalate	4.70E-01	mg/kg		1.30E+02	NoA
194	31	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
194	31	Fluoranthene	4.70E-01	mg/kg		1.09E+02	NoA
194	31	Fluorene	4.70E-01	mg/kg		9.15E+01	NoA
194	31	Hexachlorobenzene	4.70E-01	mg/kg		4.92E-02	Yes
194	31	Hexachlorobutadiene	4.70E-01	mg/kg		2.22E+00	NoA
194	31	Hexachlorocyclopentadiene	4.70E-01	mg/kg		1.95E+01	NoA
194	31	Hexachloroethane	4.70E-01	mg/kg		2.28E+00	NoA
194	31	Isophorone	4.70E-01	mg/kg		1.82E+02	NoA
194	31	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
194	31	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
194	31	Mercury	2.00E-01	mg/kg	2.00E-01	2.13E-01	NoA
194	31	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
194	31	Naphthalene	4.70E-01	mg/kg		1.15E+00	NoA
194	31	Nitrobenzene	4.70E-01	mg/kg		4.79E+00	NoA
194	31	N-Nitroso-di-n-propylamine	4.70E-01	mg/kg		1.89E-02	Yes
194	31	N-Nitrosodiphenylamine	4.70E-01	mg/kg		3.22E+01	NoA
194	31	PCB, Total	1.00E-01	mg/kg		6.48E-02	Yes
194	31	Pentachlorophenol	4.70E-01	mg/kg		4.36E-01	Yes
194	31	Phenanthrene	4.70E-01	mg/kg			NoC
194	31	Phenol	4.70E-01	mg/kg		4.98E+02	NoA
194	31	p-Nitroaniline	4.70E-01	mg/kg		8.66E+00	NoA
194	31	Pyrene	4.70E-01	mg/kg		8.12E+01	NoA
194	31	Pyridine	4.70E-01	mg/kg		7.82E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
194	31	Selenium	1.00E+00	mg/kg	8.00E-01	2.30E+01	NoA
194	31	Silver	4.00E+00	mg/kg	2.30E+00	2.61E+00	Yes
194	31	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
194	31	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
194	31	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
194	31	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
194	31	Total PAH	4.70E-01	mg/kg		1.97E-02	Yes
194	31	Total Xylene	3.00E-02	mg/kg		7.96E+00	NoA
194	31	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
194	31	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
194	31	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
194	31	Vinyl acetate	1.00E-02	mg/kg		1.83E+01	NoA
194	31	Vinyl chloride	1.00E-02	mg/kg		8.24E-02	NoA
196	1	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
196	1	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
196	1	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
196	1	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
196	1	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
196	1	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
196	1	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
196	1	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
196	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
196	1	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
196	1	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
196	1	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
196	1	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
196	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
196	1	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
196	1	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
196	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
196	1	2-Nitrophenol	3.80E-01	mg/kg			NoC
196	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
196	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
196	1	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
196	1	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
196	1	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
196	1	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
196	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
196	1	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
196	1	Acenaphthylene	3.80E-01	mg/kg			NoC
196	1	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
196	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
196	1	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
196	1	Benzo(ghi)perylene	3.80E-01	mg/kg			NoC
196	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
196	1	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
196	1	Bis(2-chloroethyl) ether	7.60E-03	mg/kg		2.14E-01	NoA
196	1	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
196	1	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
196	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
196	1	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
196	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
196	1	Dimethyl phthalate	3.80E-01	mg/kg			NoC
196	1	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
196	1	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
196	1	Fluoranthene	3.80E-01	mg/kg		1.09E+02	NoA
196	1	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
196	1	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
196	1	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
196	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
196	1	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
196	1	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
196	1	m,p-Cresol	7.60E-01	mg/kg		3.91E+01	NoA
196	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
196	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
196	1	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
196	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
196	1	N-Nitroso-di-n-propylamine	7.60E-03	mg/kg		1.89E-02	NoA
196	1	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
196	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
196	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
196	1	Phenanthrene	3.80E-01	mg/kg			NoC
196	1	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
196	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
196	1	Pyrene	3.80E-01	mg/kg		8.12E+01	NoA
196	1	Pyridine	7.60E-01	mg/kg		7.82E+00	NoA
196	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
196	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
196	1	Total PAH	7.60E-03	mg/kg		1.97E-02	NoA
196	2	Acenaphthene	4.98E-01	mg/kg		1.17E+02	NoA
196	2	Acenaphthylene	4.98E-01	mg/kg			NoC
196	2	Anthracene	4.98E-01	mg/kg		7.47E+02	NoA
196	2	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
196	2	Benzene	1.00E+00	mg/kg		3.33E-01	Yes
196	2	Benzo(ghi)perylene	4.98E-01	mg/kg			NoC
196	2	Beryllium	1.81E-01	mg/kg	6.70E-01	5.67E-03	NoB
196	2	Ethylbenzene	1.00E+00	mg/kg		1.58E+00	NoA
196	2	Fluoranthene	4.98E-01	mg/kg		1.09E+02	NoA
196	2	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
196	2	Lead	2.50E+01	mg/kg	3.60E+01	4.00E+02	NoAB
196	2	Mercury	2.00E-01	mg/kg	2.00E-01	2.13E-01	NoA
196	2	Naphthalene	4.98E-01	mg/kg		1.15E+00	NoA
196	2	Phenanthrene	4.98E-01	mg/kg			NoC
196	2	Pyrene	4.98E-01	mg/kg		8.12E+01	NoA
196	2	Selenium	1.00E+00	mg/kg	8.00E-01	2.30E+01	NoA
196	2	Silver	3.00E+00	mg/kg	2.30E+00	2.61E+00	Yes
196	2	Toluene	1.00E+00	mg/kg		9.61E+01	NoA
196	2	Total Xylene	1.00E+00	mg/kg		7.96E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
196	2	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
489	1	1,1,1,2-Tetrachloroethane	5.70E-03	mg/kg		1.86E+00	NoA
489	1	1,1,1-Trichloroethane	5.70E-03	mg/kg		1.46E+02	NoA
489	1	1,1,2,2-Tetrachloroethane	5.70E-03	mg/kg		5.62E-01	NoA
489	1	1,1,2-Trichloroethane	5.70E-03	mg/kg		2.30E-02	NoA
489	1	1,1-Dichloroethane	5.70E-03	mg/kg		1.34E+00	NoA
489	1	1,1-Dichloroethene	5.70E-03	mg/kg		2.37E-02	NoA
489	1	1,2,3-Trichloropropane	5.70E-03	mg/kg		4.97E-03	Yes
489	1	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
489	1	1,2-Dibromoethane	5.70E-03	mg/kg		3.37E-02	NoA
489	1	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
489	1	1,2-Dichloroethane	5.70E-03	mg/kg		1.55E-01	NoA
489	1	1,2-Dichloropropane	5.70E-03	mg/kg		9.40E-01	NoA
489	1	1,2-Dimethylbenzene	5.70E-03	mg/kg		5.35E+01	NoA
489	1	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
489	1	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
489	1	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
489	1	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
489	1	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
489	1	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
489	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
489	1	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
489	1	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
489	1	2-Butanone	2.30E-02	mg/kg		5.78E+02	NoA
489	1	2-Chloroethyl vinyl ether	2.30E-02	mg/kg			NoC
489	1	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
489	1	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
489	1	2-Hexanone	2.30E-02	mg/kg		4.05E+00	NoA
489	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
489	1	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
489	1	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
489	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
489	1	2-Nitrophenol	3.80E-01	mg/kg			NoC
489	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
489	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
489	1	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
489	1	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
489	1	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
489	1	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
489	1	4-Methyl-2-pentanone	2.30E-02	mg/kg		1.13E+02	NoA
489	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
489	1	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
489	1	Acenaphthylene	3.80E-01	mg/kg			NoC
489	1	Acetone	2.30E-02	mg/kg		1.34E+03	NoA
489	1	Acrolein	5.70E-02	mg/kg			NoC
489	1	Acrylonitrile	5.70E-02	mg/kg		7.43E-02	NoA
489	1	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
489	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
489	1	Benzene	5.70E-03	mg/kg		3.33E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
489	1	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
489	1	Benzo(ghi)perylene	3.80E-01	mg/kg			NoC
489	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
489	1	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
489	1	Bis(2-chloroethyl) ether	7.60E-03	mg/kg		2.14E-01	NoA
489	1	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
489	1	Bis(2-ethylhexyl)phthalate	3.80E-01	mg/kg		1.25E+01	NoA
489	1	Bromodichloromethane	5.70E-03	mg/kg		2.73E-01	NoA
489	1	Bromoform	5.70E-03	mg/kg		2.19E+01	NoA
489	1	Bromomethane	1.10E-02	mg/kg		1.34E-01	NoA
489	1	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
489	1	Carbon disulfide	5.70E-03	mg/kg		1.48E+01	NoA
489	1	Carbon tetrachloride	5.70E-03	mg/kg		2.39E-01	NoA
489	1	Chlorobenzene	5.70E-03	mg/kg		4.07E+00	NoA
489	1	Chloroethane	1.10E-02	mg/kg		1.45E+03	NoA
489	1	Chloroform	5.70E-03	mg/kg		1.22E-01	NoA
489	1	Chloromethane	1.10E-02	mg/kg		1.65E+00	NoA
489	1	cis-1,2-Dichloroethene	5.70E-03	mg/kg		1.05E+00	NoA
489	1	cis-1,3-Dichloropropene	5.70E-03	mg/kg			NoC
489	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
489	1	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
489	1	Dibromochloromethane	5.70E-03	mg/kg		2.42E-01	NoA
489	1	Dibromomethane	5.70E-03	mg/kg		2.46E+00	NoA
489	1	Dichlorodifluoromethane	1.10E-02	mg/kg		9.38E+00	NoA
489	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
489	1	Dimethyl phthalate	3.80E-01	mg/kg			NoC
489	1	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
489	1	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
489	1	Ethyl methacrylate	5.70E-03	mg/kg		1.52E+02	NoA
489	1	Ethylbenzene	5.70E-03	mg/kg		1.58E+00	NoA
489	1	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
489	1	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
489	1	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
489	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
489	1	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
489	1	Iodomethane	5.70E-03	mg/kg			NoC
489	1	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
489	1	m,p-Cresol	7.60E-01	mg/kg		3.91E+01	NoA
489	1	m,p-Xylene	5.70E-03	mg/kg		7.96E+00	NoA
489	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
489	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
489	1	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
489	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
489	1	N-Nitroso-di-n-propylamine	7.60E-03	mg/kg		1.89E-02	NoA
489	1	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
489	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
489	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
489	1	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
489	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
489	1	Pyridine	7.60E-01	mg/kg		7.82E+00	NoA
489	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
489	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
489	1	Styrene	5.70E-03	mg/kg		9.43E+01	NoA
489	1	Tetrachloroethene	5.70E-03	mg/kg		1.13E-01	NoA
489	1	Toluene	5.70E-03	mg/kg		9.61E+01	NoA
489	1	trans-1,2-Dichloroethene	5.70E-03	mg/kg		2.43E+00	NoA
489	1	trans-1,3-Dichloropropene	5.70E-03	mg/kg			NoC
489	1	Trans-1,4-Dichloro-2-butene	1.10E-02	mg/kg		6.94E-03	Yes
489	1	Trichloroethene	5.70E-03	mg/kg		2.34E-02	NoA
489	1	Trichlorofluoromethane	5.70E-03	mg/kg		7.87E+01	NoA
489	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
489	1	Vinyl acetate	5.70E-03	mg/kg		1.83E+01	NoA
489	1	Vinyl chloride	5.70E-03	mg/kg		8.24E-02	NoA
531	1	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
531	1	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
531	1	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
531	1	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
531	1	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
531	1	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
531	1	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
531	1	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
531	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
531	1	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
531	1	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
531	1	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
531	1	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
531	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
531	1	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
531	1	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
531	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
531	1	2-Nitrophenol	3.50E-01	mg/kg			NoC
531	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
531	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
531	1	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
531	1	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
531	1	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
531	1	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
531	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
531	1	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
531	1	Acenaphthylene	3.50E-01	mg/kg			NoC
531	1	Anthracene	3.50E-01	mg/kg		7.47E+02	NoA
531	1	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
531	1	Benzo(ghi)perylene	3.50E-01	mg/kg			NoC
531	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
531	1	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
531	1	Bis(2-chloroethyl) ether	6.90E-03	mg/kg		2.14E-01	NoA
531	1	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
531	1	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
531	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
531	1	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
531	1	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
531	1	Dimethyl phthalate	3.50E-01	mg/kg			NoC
531	1	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
531	1	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
531	1	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
531	1	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
531	1	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
531	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
531	1	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
531	1	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
531	1	m,p-Cresol	6.90E-01	mg/kg		3.91E+01	NoA
531	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
531	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
531	1	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
531	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
531	1	N-Nitroso-di-n-propylamine	6.90E-03	mg/kg		1.89E-02	NoA
531	1	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
531	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
531	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
531	1	Phenanthrene	3.50E-01	mg/kg			NoC
531	1	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
531	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
531	1	Pyridine	6.90E-01	mg/kg		7.82E+00	NoA
531	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
531	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
531	1	Thallium	2.10E-01	mg/kg	2.10E-01	3.68E-01	NoA
200	1	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
200	1	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
200	1	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
200	1	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
200	1	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
200	1	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
200	1	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
200	1	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
200	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
200	1	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
200	1	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
200	1	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
200	1	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
200	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
200	1	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
200	1	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
200	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
200	1	2-Nitrophenol	3.70E-01	mg/kg			NoC
200	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
200	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
200	1	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
200	1	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
200	1	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
200	1	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
200	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
200	1	Acenaphthene	3.70E-01	mg/kg		1.17E+02	NoA
200	1	Acenaphthylene	3.70E-01	mg/kg			NoC
200	1	Anthracene	3.70E-01	mg/kg		7.47E+02	NoA
200	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
200	1	Benzenemethanol	3.70E-01	mg/kg		3.26E+02	NoA
200	1	Benzo(ghi)perylene	3.70E-01	mg/kg			NoC
200	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
200	1	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
200	1	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
200	1	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
200	1	Bis(2-ethylhexyl)phthalate	3.70E-01	mg/kg		1.25E+01	NoA
200	1	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
200	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
200	1	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
200	1	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
200	1	Dimethyl phthalate	3.70E-01	mg/kg			NoC
200	1	Di-n-butyl phthalate	3.70E-01	mg/kg		3.26E+02	NoA
200	1	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
200	1	Fluoranthene	3.70E-01	mg/kg		1.09E+02	NoA
200	1	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
200	1	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
200	1	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
200	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
200	1	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
200	1	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
200	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
200	1	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA
200	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
200	1	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
200	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
200	1	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
200	1	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
200	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
200	1	Phenanthrene	3.70E-01	mg/kg			NoC
200	1	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
200	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
200	1	Pyrene	3.70E-01	mg/kg		8.12E+01	NoA
200	1	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
200	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
200	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
212	1	1,1,1-Trichloroethane	5.00E-03	mg/kg		1.46E+02	NoA
212	1	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
212	1	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
212	1	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
212	1	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
212	1	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
212	1	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
212	1	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
212	1	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
212	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
212	1	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
212	1	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
212	1	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
212	1	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
212	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
212	1	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
212	1	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
212	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
212	1	2-Nitrophenol	3.40E-01	mg/kg			NoC
212	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
212	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
212	1	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
212	1	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
212	1	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
212	1	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
212	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
212	1	Acenaphthene	4.90E-01	mg/kg		1.17E+02	NoA
212	1	Acenaphthylene	4.90E-01	mg/kg			NoC
212	1	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
212	1	Antimony	9.74E+00	mg/kg	2.10E-01	5.52E-01	Yes
212	1	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
212	1	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
212	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
212	1	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
212	1	Bis(2-chloroethyl) ether	3.30E-01	mg/kg		2.14E-01	Yes
212	1	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
212	1	Bis(2-ethylhexyl)phthalate	3.40E-01	mg/kg		1.25E+01	NoA
212	1	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
212	1	Cadmium	1.95E+00	mg/kg	2.10E-01	8.11E-01	Yes
212	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
212	1	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
212	1	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
212	1	Dimethyl phthalate	3.40E-01	mg/kg			NoC
212	1	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
212	1	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
212	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
212	1	Fluorene	4.90E-01	mg/kg		9.15E+01	NoA
212	1	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
212	1	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
212	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
212	1	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
212	1	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
212	1	Lead	1.95E+01	mg/kg	3.60E+01	4.00E+02	NoAB
212	1	m,p-Cresol	6.90E-01	mg/kg		3.91E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
212	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
212	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
212	1	Naphthalene	4.90E-01	mg/kg		1.15E+00	NoA
212	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
212	1	N-Nitroso-di-n-propylamine	3.30E-01	mg/kg		1.89E-02	Yes
212	1	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
212	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
212	1	Phenanthrene	4.90E-01	mg/kg			NoC
212	1	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
212	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
212	1	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
212	1	Pyridine	6.90E-01	mg/kg		7.82E+00	NoA
212	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
212	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
212	1	Sodium	9.74E+01	mg/kg	3.20E+02		NoBE
212	1	Thallium	1.95E+01	mg/kg	2.10E-01	3.68E-01	Yes
212	1	Total PAH	4.90E-01	mg/kg		1.97E-02	Yes
212	1	Trichloroethene	5.00E-03	mg/kg		2.34E-02	NoA
213	1	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
213	1	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
213	1	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
213	1	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
213	1	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
213	1	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
213	1	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
213	1	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
213	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
213	1	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
213	1	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
213	1	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
213	1	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
213	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
213	1	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
213	1	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
213	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
213	1	2-Nitrophenol	3.40E-01	mg/kg			NoC
213	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
213	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
213	1	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
213	1	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
213	1	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
213	1	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
213	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
213	1	Acenaphthene	3.40E-01	mg/kg		1.17E+02	NoA
213	1	Acenaphthylene	3.40E-01	mg/kg			NoC
213	1	Anthracene	3.40E-01	mg/kg		7.47E+02	NoA
213	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
213	1	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
213	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
213	1	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
213	1	Bis(2-chloroethyl) ether	6.90E-03	mg/kg		2.14E-01	NoA
213	1	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
213	1	Bis(2-ethylhexyl)phthalate	3.40E-01	mg/kg		1.25E+01	NoA
213	1	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
213	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
213	1	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
213	1	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
213	1	Dimethyl phthalate	3.40E-01	mg/kg			NoC
213	1	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
213	1	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
213	1	Fluorene	3.40E-01	mg/kg		9.15E+01	NoA
213	1	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
213	1	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
213	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
213	1	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
213	1	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
213	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
213	1	m,p-Cresol	6.90E-01	mg/kg		3.91E+01	NoA
213	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
213	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
213	1	Naphthalene	3.40E-01	mg/kg		1.15E+00	NoA
213	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
213	1	N-Nitroso-di-n-propylamine	6.90E-03	mg/kg		1.89E-02	NoA
213	1	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
213	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
213	1	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
213	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
213	1	Pyridine	6.90E-01	mg/kg		7.82E+00	NoA
213	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
213	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
213	2	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
213	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
213	2	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
213	2	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
213	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
213	2	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
213	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
213	2	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
214	1	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
214	1	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
214	1	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
214	1	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
214	1	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
214	1	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
214	1	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
214	1	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
214	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
214	1	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
214	1	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
214	1	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
214	1	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
214	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
214	1	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
214	1	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
214	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
214	1	2-Nitrophenol	3.70E-01	mg/kg			NoC
214	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
214	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
214	1	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
214	1	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
214	1	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
214	1	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
214	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
214	1	Acenaphthene	3.70E-01	mg/kg		1.17E+02	NoA
214	1	Acenaphthylene	3.70E-01	mg/kg			NoC
214	1	Anthracene	3.70E-01	mg/kg		7.47E+02	NoA
214	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
214	1	Benzenemethanol	3.70E-01	mg/kg		3.26E+02	NoA
214	1	Benzo(ghi)perylene	3.70E-01	mg/kg			NoC
214	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
214	1	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
214	1	Bis(2-chloroethyl) ether	7.50E-03	mg/kg		2.14E-01	NoA
214	1	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
214	1	Bis(2-ethylhexyl)phthalate	3.70E-01	mg/kg		1.25E+01	NoA
214	1	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
214	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
214	1	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
214	1	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
214	1	Dimethyl phthalate	3.70E-01	mg/kg			NoC
214	1	Di-n-butyl phthalate	3.70E-01	mg/kg		3.26E+02	NoA
214	1	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
214	1	Fluoranthene	3.70E-01	mg/kg		1.09E+02	NoA
214	1	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
214	1	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
214	1	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
214	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
214	1	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
214	1	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
214	1	m,p-Cresol	7.50E-01	mg/kg		3.91E+01	NoA
214	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
214	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
214	1	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
214	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
214	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
214	1	N-Nitroso-di-n-propylamine	7.50E-03	mg/kg		1.89E-02	NoA
214	1	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
214	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
214	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
214	1	Phenanthrene	3.70E-01	mg/kg			NoC
214	1	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
214	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
214	1	Pyrene	3.70E-01	mg/kg		8.12E+01	NoA
214	1	Pyridine	7.50E-01	mg/kg		7.82E+00	NoA
214	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
214	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
214	1	Thallium	2.30E-01	mg/kg	2.10E-01	3.68E-01	NoA
214	1	Total PAH	7.50E-03	mg/kg		1.97E-02	NoA
214	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
215	1	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
215	1	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
215	1	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
215	1	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
215	1	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
215	1	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
215	1	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
215	1	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
215	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
215	1	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
215	1	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
215	1	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
215	1	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
215	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
215	1	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
215	1	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
215	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
215	1	2-Nitrophenol	3.50E-01	mg/kg			NoC
215	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
215	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
215	1	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
215	1	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
215	1	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
215	1	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
215	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
215	1	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
215	1	Acenaphthylene	3.50E-01	mg/kg			NoC
215	1	Anthracene	3.50E-01	mg/kg		7.47E+02	NoA
215	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
215	1	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
215	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
215	1	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
215	1	Bis(2-chloroethyl) ether	6.90E-03	mg/kg		2.14E-01	NoA
215	1	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
215	1	Bis(2-ethylhexyl)phthalate	3.50E-01	mg/kg		1.25E+01	NoA
215	1	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
215	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
215	1	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
215	1	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
215	1	Dimethyl phthalate	3.50E-01	mg/kg			NoC
215	1	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
215	1	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
215	1	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
215	1	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
215	1	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
215	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
215	1	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
215	1	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
215	1	m,p-Cresol	6.90E-01	mg/kg		3.91E+01	NoA
215	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
215	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
215	1	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
215	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
215	1	N-Nitroso-di-n-propylamine	6.90E-03	mg/kg		1.89E-02	NoA
215	1	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
215	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
215	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
215	1	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
215	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
215	1	Pyridine	6.90E-01	mg/kg		7.82E+00	NoA
215	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
215	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
215	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
216	1	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
216	1	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
216	1	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
216	1	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
216	1	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
216	1	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
216	1	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
216	1	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
216	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
216	1	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
216	1	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
216	1	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
216	1	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
216	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
216	1	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
216	1	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
216	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
216	1	2-Nitrophenol	3.80E-01	mg/kg			NoC
216	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
216	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
216	1	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
216	1	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
216	1	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
216	1	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
216	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
216	1	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
216	1	Acenaphthylene	3.80E-01	mg/kg			NoC
216	1	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
216	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
216	1	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
216	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
216	1	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
216	1	Bis(2-chloroethyl) ether	7.60E-03	mg/kg		2.14E-01	NoA
216	1	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
216	1	Bis(2-ethylhexyl)phthalate	3.80E-01	mg/kg		1.25E+01	NoA
216	1	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
216	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
216	1	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
216	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
216	1	Dimethyl phthalate	3.80E-01	mg/kg			NoC
216	1	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
216	1	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
216	1	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
216	1	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
216	1	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
216	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
216	1	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
216	1	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
216	1	m,p-Cresol	7.60E-01	mg/kg		3.91E+01	NoA
216	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
216	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
216	1	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
216	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
216	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
216	1	N-Nitroso-di-n-propylamine	7.60E-03	mg/kg		1.89E-02	NoA
216	1	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
216	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
216	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
216	1	Phenanthrene	3.80E-01	mg/kg			NoC
216	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
216	1	Pyridine	7.60E-01	mg/kg		7.82E+00	NoA
216	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
216	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
217	1	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
217	1	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
217	1	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
217	1	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
217	1	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
217	1	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
217	1	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
217	1	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
217	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
217	1	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
217	1	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
217	1	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
217	1	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
217	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
217	1	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
217	1	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
217	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
217	1	2-Nitrophenol	3.60E-01	mg/kg			NoC
217	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
217	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
217	1	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
217	1	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
217	1	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
217	1	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
217	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
217	1	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
217	1	Acenaphthylene	3.60E-01	mg/kg			NoC
217	1	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
217	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
217	1	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
217	1	Benzo(ghi)perylene	3.60E-01	mg/kg			NoC
217	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
217	1	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
217	1	Bis(2-chloroethyl) ether	7.10E-03	mg/kg		2.14E-01	NoA
217	1	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
217	1	Bis(2-ethylhexyl)phthalate	3.60E-01	mg/kg		1.25E+01	NoA
217	1	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
217	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
217	1	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
217	1	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
217	1	Dimethyl phthalate	3.60E-01	mg/kg			NoC
217	1	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
217	1	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
217	1	Fluoranthene	3.60E-01	mg/kg		1.09E+02	NoA
217	1	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
217	1	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
217	1	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
217	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
217	1	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
217	1	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
217	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
217	1	m,p-Cresol	7.10E-01	mg/kg		3.91E+01	NoA
217	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
217	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
217	1	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
217	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
217	1	N-Nitroso-di-n-propylamine	7.10E-03	mg/kg		1.89E-02	NoA
217	1	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
217	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
217	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
217	1	Phenanthrene	3.60E-01	mg/kg			NoC
217	1	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
217	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
217	1	Pyrene	3.60E-01	mg/kg		8.12E+01	NoA
217	1	Pyridine	7.10E-01	mg/kg		7.82E+00	NoA
217	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
217	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
217	2	1,1,1-Trichloroethane	6.00E-03	mg/kg		1.46E+02	NoA
217	2	1,1,2,2-Tetrachloroethane	6.00E-03	mg/kg		5.62E-01	NoA
217	2	1,1,2-Trichloroethane	6.00E-03	mg/kg		2.30E-02	NoA
217	2	1,1-Dichloroethane	6.00E-03	mg/kg		1.34E+00	NoA
217	2	1,1-Dichloroethene	6.00E-03	mg/kg		2.37E-02	NoA
217	2	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
217	2	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
217	2	1,2-Dichloroethane	6.00E-03	mg/kg		1.55E-01	NoA
217	2	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
217	2	1,2-Dichloropropane	6.00E-03	mg/kg		9.40E-01	NoA
217	2	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
217	2	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
217	2	2,4,5-Trichlorophenol	1.80E+00	mg/kg		3.26E+02	NoA
217	2	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
217	2	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
217	2	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
217	2	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
217	2	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
217	2	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
217	2	2-Butanone	1.10E-01	mg/kg		5.78E+02	NoA
217	2	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
217	2	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
217	2	2-Hexanone	5.70E-02	mg/kg		4.05E+00	NoA
217	2	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
217	2	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
217	2	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
217	2	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
217	2	2-Nitrophenol	3.70E-01	mg/kg			NoC
217	2	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
217	2	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
217	2	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
217	2	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
217	2	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
217	2	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
217	2	4-Methyl-2-pentanone	5.70E-02	mg/kg		1.13E+02	NoA
217	2	4-Nitrophenol	1.80E+00	mg/kg			NoC
217	2	Acenaphthene	3.70E-01	mg/kg		1.17E+02	NoA
217	2	Acenaphthylene	3.70E-01	mg/kg			NoC
217	2	Acetone	1.10E-01	mg/kg		1.34E+03	NoA
217	2	Anthracene	3.70E-01	mg/kg		7.47E+02	NoA
217	2	Benzene	6.00E-03	mg/kg		3.33E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
217	2	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
217	2	Benzo(ghi)perylene	3.70E-01	mg/kg			NoC
217	2	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
217	2	Beryllium	5.00E-01	mg/kg	6.70E-01	5.67E-03	NoB
217	2	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
217	2	Bis(2-chloroethyl) ether	3.70E-01	mg/kg		2.14E-01	Yes
217	2	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
217	2	Bis(2-ethylhexyl)phthalate	3.70E-01	mg/kg		1.25E+01	NoA
217	2	Bromodichloromethane	6.00E-03	mg/kg		2.73E-01	NoA
217	2	Bromoform	6.00E-03	mg/kg		2.19E+01	NoA
217	2	Bromomethane	1.10E-02	mg/kg		1.34E-01	NoA
217	2	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
217	2	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
217	2	Carbazole	3.70E-01	mg/kg		8.72E+00	NoA
217	2	Carbon disulfide	6.00E-03	mg/kg		1.48E+01	NoA
217	2	Carbon tetrachloride	6.00E-03	mg/kg		2.39E-01	NoA
217	2	Chlorobenzene	6.00E-03	mg/kg		4.07E+00	NoA
217	2	Chloroethane	1.10E-02	mg/kg		1.45E+03	NoA
217	2	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
217	2	Chloromethane	1.10E-02	mg/kg		1.65E+00	NoA
217	2	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
217	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
217	2	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
217	2	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA
217	2	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
217	2	Dimethyl phthalate	3.70E-01	mg/kg			NoC
217	2	Di-n-butyl phthalate	4.80E-01	mg/kg		3.26E+02	NoA
217	2	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
217	2	Ethylbenzene	6.00E-03	mg/kg		1.58E+00	NoA
217	2	Fluoranthene	3.70E-01	mg/kg		1.09E+02	NoA
217	2	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
217	2	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
217	2	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
217	2	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
217	2	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
217	2	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
217	2	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
217	2	m,p-Cresol	7.10E-01	mg/kg		3.91E+01	NoA
217	2	Methylene chloride	2.00E-02	mg/kg		3.65E+00	NoA
217	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
217	2	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
217	2	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
217	2	N-Nitroso-di-n-propylamine	3.70E-01	mg/kg		1.89E-02	Yes
217	2	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
217	2	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
217	2	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
217	2	Phenanthrene	3.70E-01	mg/kg			NoC
217	2	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
217	2	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
217	2	Pyrene	3.70E-01	mg/kg		8.12E+01	NoA
217	2	Pyridine	7.10E-01	mg/kg		7.82E+00	NoA
217	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
217	2	Styrene	6.00E-03	mg/kg		9.43E+01	NoA
217	2	Tetrachloroethene	6.00E-03	mg/kg		1.13E-01	NoA
217	2	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
217	2	Toluene	6.00E-03	mg/kg		9.61E+01	NoA
217	2	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
217	2	trans-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
217	2	Trichloroethene	6.00E-03	mg/kg		2.34E-02	NoA
217	2	Uranium	2.00E+02	mg/kg	4.90E+00	1.38E+01	Yes
217	2	Vinyl chloride	1.10E-02	mg/kg		8.24E-02	NoA
221	1	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
221	1	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
221	1	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
221	1	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
221	1	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
221	1	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
221	1	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
221	1	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
221	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
221	1	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
221	1	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
221	1	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
221	1	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
221	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
221	1	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
221	1	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
221	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
221	1	2-Nitrophenol	3.50E-01	mg/kg			NoC
221	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
221	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
221	1	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
221	1	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
221	1	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
221	1	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
221	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
221	1	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
221	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
221	1	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
221	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
221	1	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
221	1	Bis(2-chloroethyl) ether	7.00E-03	mg/kg		2.14E-01	NoA
221	1	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
221	1	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
221	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
221	1	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
221	1	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
221	1	Dimethyl phthalate	3.50E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
221	1	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
221	1	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
221	1	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
221	1	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
221	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
221	1	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
221	1	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
221	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
221	1	m,p-Cresol	7.00E-01	mg/kg		3.91E+01	NoA
221	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
221	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
221	1	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
221	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
221	1	N-Nitroso-di-n-propylamine	7.00E-03	mg/kg		1.89E-02	NoA
221	1	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
221	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
221	1	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
221	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
221	1	Pyridine	7.00E-01	mg/kg		7.82E+00	NoA
221	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
221	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
222	1	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
222	1	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
222	1	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
222	1	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
222	1	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
222	1	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
222	1	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
222	1	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
222	1	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
222	1	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
222	1	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
222	1	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
222	1	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
222	1	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
222	1	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
222	1	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
222	1	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
222	1	2-Nitrophenol	4.10E-01	mg/kg			NoC
222	1	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
222	1	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
222	1	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
222	1	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
222	1	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
222	1	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
222	1	4-Nitrophenol	2.00E+00	mg/kg			NoC
222	1	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
222	1	Acenaphthylene	4.10E-01	mg/kg			NoC
222	1	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
222	1	Antimony	7.00E-01	mg/kg	2.10E-01	5.52E-01	Yes
222	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
222	1	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
222	1	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
222	1	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
222	1	Bis(2-chloroethyl) ether	8.20E-03	mg/kg		2.14E-01	NoA
222	1	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
222	1	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
222	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
222	1	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
222	1	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
222	1	Dimethyl phthalate	4.10E-01	mg/kg			NoC
222	1	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
222	1	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
222	1	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
222	1	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
222	1	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
222	1	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
222	1	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
222	1	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
222	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
222	1	m,p-Cresol	8.20E-01	mg/kg		3.91E+01	NoA
222	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
222	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
222	1	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
222	1	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
222	1	N-Nitroso-di-n-propylamine	8.20E-03	mg/kg		1.89E-02	NoA
222	1	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
222	1	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
222	1	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
222	1	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
222	1	Pyridine	8.20E-01	mg/kg		7.82E+00	NoA
222	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
222	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
227	1	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
227	1	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
227	1	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
227	1	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
227	1	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
227	1	1,2,4-Trichlorobenzene	5.00E-01	mg/kg		7.86E-01	NoA
227	1	1,2-Dichlorobenzene	5.00E-01	mg/kg		2.92E+01	NoA
227	1	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
227	1	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
227	1	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
227	1	1,3-Dichlorobenzene	5.00E-01	mg/kg			NoC
227	1	1,4-Dichlorobenzene	5.00E-01	mg/kg		8.13E-01	NoA
227	1	2,4,5-Trichlorophenol	5.00E-01	mg/kg		3.26E+02	NoA
227	1	2,4,6-Trichlorophenol	5.00E-01	mg/kg		3.26E+00	NoA
227	1	2,4-Dichlorophenol	5.00E-01	mg/kg		9.78E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
227	1	2,4-Dimethylphenol	5.00E-01	mg/kg		6.52E+01	NoA
227	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
227	1	2,4-Dinitrotoluene	5.00E-01	mg/kg		5.63E-01	NoA
227	1	2,6-Dinitrotoluene	5.00E-01	mg/kg		3.26E+00	NoA
227	1	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
227	1	2-Chloronaphthalene	5.00E-01	mg/kg		6.26E+02	NoA
227	1	2-Chlorophenol	5.00E-01	mg/kg		3.91E+01	NoA
227	1	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
227	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
227	1	2-Methylnaphthalene	5.00E-01	mg/kg		1.30E+01	NoA
227	1	2-Methylphenol	5.00E-01	mg/kg		1.54E+02	NoA
227	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
227	1	2-Nitrophenol	5.00E-01	mg/kg			NoC
227	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
227	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
227	1	4-Bromophenyl phenyl ether	5.00E-01	mg/kg			NoC
227	1	4-Chloro-3-methylphenol	5.00E-01	mg/kg			NoC
227	1	4-Chlorobenzenamine	5.00E-01	mg/kg		8.66E-01	NoA
227	1	4-Chlorophenyl phenyl ether	5.00E-01	mg/kg			NoC
227	1	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
227	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
227	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
227	1	Acenaphthylene	5.00E-01	mg/kg			NoC
227	1	Acetone	1.00E-02	mg/kg		1.34E+03	NoA
227	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
227	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
227	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
227	1	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
227	1	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
227	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
227	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
227	1	Bis(2-chloroethoxy)methane	5.00E-01	mg/kg		9.78E+00	NoA
227	1	Bis(2-chloroethyl) ether	5.00E-01	mg/kg		2.14E-01	Yes
227	1	Bis(2-chloroisopropyl) ether	5.00E-01	mg/kg		4.57E+00	NoA
227	1	Bis(2-ethylhexyl)phthalate	5.00E-01	mg/kg		1.25E+01	NoA
227	1	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
227	1	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
227	1	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
227	1	Butyl benzyl phthalate	5.00E-01	mg/kg		9.18E+01	NoA
227	1	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
227	1	Carbazole	5.00E-01	mg/kg		8.72E+00	NoA
227	1	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
227	1	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
227	1	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
227	1	Cobalt	2.50E+00	mg/kg	1.40E+01	1.37E+00	NoB
227	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
227	1	Dibenzofuran	5.00E-01	mg/kg		3.26E+00	NoA
227	1	Diethyl phthalate	5.00E-01	mg/kg		2.61E+03	NoA
227	1	Dimethyl phthalate	5.00E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
227	1	Di-n-butyl phthalate	5.00E-01	mg/kg		3.26E+02	NoA
227	1	Di-n-octylphthalate	5.00E-01	mg/kg		1.30E+02	NoA
227	1	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
227	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
227	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
227	1	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
227	1	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
227	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
227	1	Hexachloroethane	5.00E-01	mg/kg		2.28E+00	NoA
227	1	Isophorone	5.00E-01	mg/kg		1.82E+02	NoA
227	1	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
227	1	m,p-Cresol	7.10E-01	mg/kg		3.91E+01	NoA
227	1	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
227	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
227	1	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
227	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
227	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
227	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
227	1	N-Nitroso-di-n-propylamine	5.00E-01	mg/kg		1.89E-02	Yes
227	1	N-Nitrosodiphenylamine	5.00E-01	mg/kg		3.22E+01	NoA
227	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
227	1	Phenanthrene	5.00E-01	mg/kg			NoC
227	1	Phenol	5.00E-01	mg/kg		4.98E+02	NoA
227	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
227	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
227	1	Pyridine	7.10E-01	mg/kg		7.82E+00	NoA
227	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
227	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
227	1	Sodium	9.38E+01	mg/kg	3.20E+02		NoBE
227	1	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
227	1	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
227	1	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
227	1	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
227	1	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
227	1	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
227	1	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
227	1	Zinc	2.00E+01	mg/kg	6.50E+01	1.38E+03	NoAB
227	2	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
227	2	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
227	2	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
227	2	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
227	2	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
227	2	1,2,4-Trichlorobenzene	4.80E-01	mg/kg		7.86E-01	NoA
227	2	1,2-Dichlorobenzene	4.80E-01	mg/kg		2.92E+01	NoA
227	2	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
227	2	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
227	2	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
227	2	1,3-Dichlorobenzene	4.80E-01	mg/kg			NoC
227	2	1,4-Dichlorobenzene	4.80E-01	mg/kg		8.13E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
227	2	2,4,5-Trichlorophenol	4.80E-01	mg/kg		3.26E+02	NoA
227	2	2,4,6-Trichlorophenol	4.80E-01	mg/kg		3.26E+00	NoA
227	2	2,4-Dichlorophenol	4.80E-01	mg/kg		9.78E+00	NoA
227	2	2,4-Dimethylphenol	4.80E-01	mg/kg		6.52E+01	NoA
227	2	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
227	2	2,4-Dinitrotoluene	4.80E-01	mg/kg		5.63E-01	NoA
227	2	2,6-Dinitrotoluene	4.80E-01	mg/kg		3.26E+00	NoA
227	2	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
227	2	2-Chloronaphthalene	4.80E-01	mg/kg		6.26E+02	NoA
227	2	2-Chlorophenol	4.80E-01	mg/kg		3.91E+01	NoA
227	2	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
227	2	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
227	2	2-Methylnaphthalene	4.80E-01	mg/kg		1.30E+01	NoA
227	2	2-Methylphenol	4.80E-01	mg/kg		1.54E+02	NoA
227	2	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
227	2	2-Nitrophenol	4.80E-01	mg/kg			NoC
227	2	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
227	2	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
227	2	4-Bromophenyl phenyl ether	4.80E-01	mg/kg			NoC
227	2	4-Chloro-3-methylphenol	4.80E-01	mg/kg			NoC
227	2	4-Chlorobenzenamine	4.80E-01	mg/kg		8.66E-01	NoA
227	2	4-Chlorophenyl phenyl ether	4.80E-01	mg/kg			NoC
227	2	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
227	2	4-Nitrophenol	1.70E+00	mg/kg			NoC
227	2	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
227	2	Acenaphthylene	5.00E-01	mg/kg			NoC
227	2	Acetone	1.00E-02	mg/kg		1.34E+03	NoA
227	2	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
227	2	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
227	2	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
227	2	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
227	2	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
227	2	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
227	2	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
227	2	Bis(2-chloroethoxy)methane	4.80E-01	mg/kg		9.78E+00	NoA
227	2	Bis(2-chloroethyl) ether	4.80E-01	mg/kg		2.14E-01	Yes
227	2	Bis(2-chloroisopropyl) ether	4.80E-01	mg/kg		4.57E+00	NoA
227	2	Bis(2-ethylhexyl)phthalate	4.80E-01	mg/kg		1.25E+01	NoA
227	2	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
227	2	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
227	2	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
227	2	Butyl benzyl phthalate	4.80E-01	mg/kg		9.18E+01	NoA
227	2	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
227	2	Carbazole	4.80E-01	mg/kg		8.72E+00	NoA
227	2	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
227	2	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
227	2	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
227	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
227	2	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
227	2	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
227	2	Dimethyl phthalate	3.40E-01	mg/kg			NoC
227	2	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
227	2	Di-n-octylphthalate	4.80E-01	mg/kg		1.30E+02	NoA
227	2	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
227	2	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
227	2	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
227	2	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
227	2	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
227	2	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
227	2	Hexachloroethane	4.80E-01	mg/kg		2.28E+00	NoA
227	2	Isophorone	4.80E-01	mg/kg		1.82E+02	NoA
227	2	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
227	2	m,p-Cresol	6.90E-01	mg/kg		3.91E+01	NoA
227	2	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
227	2	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
227	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
227	2	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
227	2	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
227	2	N-Nitroso-di-n-propylamine	4.80E-01	mg/kg		1.89E-02	Yes
227	2	N-Nitrosodiphenylamine	4.80E-01	mg/kg		3.22E+01	NoA
227	2	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
227	2	Phenanthrene	5.00E-01	mg/kg			NoC
227	2	Phenol	4.80E-01	mg/kg		4.98E+02	NoA
227	2	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
227	2	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
227	2	Pyridine	6.90E-01	mg/kg		7.82E+00	NoA
227	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
227	2	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
227	2	Sodium	9.94E+01	mg/kg	3.20E+02		NoBE
227	2	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
227	2	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
227	2	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
227	2	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
227	2	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
227	2	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
227	2	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
228	1	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
228	1	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
228	1	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
228	1	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
228	1	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
228	1	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
228	1	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
228	1	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
228	1	2,4-Dinitrophenol	1.60E+00	mg/kg		6.52E+00	NoA
228	1	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
228	1	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
228	1	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
228	1	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
228	1	2-Methyl-4,6-dinitrophenol	1.60E+00	mg/kg		2.61E-01	Yes
228	1	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
228	1	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
228	1	2-Nitrobenzenamine	1.60E+00	mg/kg		2.96E-01	Yes
228	1	2-Nitrophenol	3.40E-01	mg/kg			NoC
228	1	3,3'-Dichlorobenzidine	1.60E+00	mg/kg		3.85E-01	Yes
228	1	3-Nitrobenzenamine	1.60E+00	mg/kg		9.78E-01	Yes
228	1	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
228	1	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
228	1	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
228	1	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
228	1	4-Nitrophenol	1.60E+00	mg/kg			NoC
228	1	Acenaphthene	3.40E-01	mg/kg		1.17E+02	NoA
228	1	Acenaphthylene	3.40E-01	mg/kg			NoC
228	1	Anthracene	3.40E-01	mg/kg		7.47E+02	NoA
228	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
228	1	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
228	1	Benzoic acid	1.60E+00	mg/kg		1.30E+04	NoA
228	1	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
228	1	Bis(2-chloroethyl) ether	6.80E-03	mg/kg		2.14E-01	NoA
228	1	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
228	1	Bis(2-ethylhexyl)phthalate	3.40E-01	mg/kg		1.25E+01	NoA
228	1	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
228	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
228	1	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
228	1	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
228	1	Dimethyl phthalate	3.40E-01	mg/kg			NoC
228	1	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
228	1	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
228	1	Fluorene	3.40E-01	mg/kg		9.15E+01	NoA
228	1	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
228	1	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
228	1	Hexachlorocyclopentadiene	1.60E+00	mg/kg		1.95E+01	NoA
228	1	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
228	1	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
228	1	m,p-Cresol	6.80E-01	mg/kg		3.91E+01	NoA
228	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
228	1	Naphthalene	3.40E-01	mg/kg		1.15E+00	NoA
228	1	Nitrobenzene	1.60E+00	mg/kg		4.79E+00	NoA
228	1	N-Nitroso-di-n-propylamine	6.80E-03	mg/kg		1.89E-02	NoA
228	1	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
228	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
228	1	Pentachlorophenol	1.60E+00	mg/kg		4.36E-01	Yes
228	1	Phenanthrene	3.40E-01	mg/kg			NoC
228	1	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
228	1	p-Nitroaniline	1.60E+00	mg/kg		8.66E+00	NoA
228	1	Pyridine	6.80E-01	mg/kg		7.82E+00	NoA
228	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
76	1	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
76	1	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
76	1	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
76	1	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
76	1	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
76	1	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
76	1	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
76	1	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
76	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
76	1	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
76	1	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
76	1	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
76	1	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
76	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
76	1	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
76	1	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
76	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
76	1	2-Nitrophenol	3.60E-01	mg/kg			NoC
76	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
76	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
76	1	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
76	1	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
76	1	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
76	1	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
76	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
76	1	Antimony	5.70E-01	mg/kg	2.10E-01	5.52E-01	Yes
76	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
76	1	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
76	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
76	1	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
76	1	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
76	1	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
76	1	Bis(2-ethylhexyl)phthalate	8.10E-02	mg/kg		1.25E+01	NoA
76	1	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
76	1	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
76	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
76	1	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
76	1	Dimethyl phthalate	3.60E-01	mg/kg			NoC
76	1	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
76	1	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
76	1	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
76	1	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
76	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
76	1	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
76	1	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
76	1	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA
76	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
76	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
76	1	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
76	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
76	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
76	1	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
76	1	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
76	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
76	1	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
76	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
76	1	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
76	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
76	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
76	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
165	1	1,1,1-Trichloroethane	6.10E-01	mg/kg		1.46E+02	NoA
165	1	1,1,2,2-Tetrachloroethane	1.10E-02	mg/kg		5.62E-01	NoA
165	1	1,1,2-Trichloroethane	1.10E-02	mg/kg		2.30E-02	NoA
165	1	1,1-Dichloroethane	1.10E-02	mg/kg		1.34E+00	NoA
165	1	1,1-Dichloroethene	6.10E-01	mg/kg		2.37E-02	Yes
165	1	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
165	1	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
165	1	1,2-Dichloroethane	6.10E-01	mg/kg		1.55E-01	Yes
165	1	1,2-Dichloroethene	1.10E-02	mg/kg		1.24E+00	NoA
165	1	1,2-Dichloropropane	1.10E-02	mg/kg		9.40E-01	NoA
165	1	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
165	1	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
165	1	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
165	1	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
165	1	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
165	1	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
165	1	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
165	1	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
165	1	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
165	1	2-Butanone	1.20E+01	mg/kg		5.78E+02	NoA
165	1	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
165	1	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
165	1	2-Hexanone	5.60E-02	mg/kg		4.05E+00	NoA
165	1	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
165	1	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
165	1	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
165	1	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
165	1	2-Nitrophenol	3.70E-01	mg/kg			NoC
165	1	3,3'-Dichlorobenzidine	7.50E-01	mg/kg		3.85E-01	Yes
165	1	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
165	1	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
165	1	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
165	1	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
165	1	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
165	1	4-Methyl-2-pentanone	1.20E+01	mg/kg		1.13E+02	NoA
165	1	4-Nitrophenol	1.90E+00	mg/kg			NoC
165	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
165	1	Acenaphthylene	5.00E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
165	1	Acetone	1.20E+01	mg/kg		1.34E+03	NoA
165	1	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
165	1	Benzene	6.10E-01	mg/kg		3.33E-01	Yes
165	1	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
165	1	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
165	1	Bis(2-chloroethyl) ether	3.70E-01	mg/kg		2.14E-01	Yes
165	1	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
165	1	Bis(2-ethylhexyl)phthalate	3.70E-01	mg/kg		1.25E+01	NoA
165	1	Bromodichloromethane	1.10E-02	mg/kg		2.73E-01	NoA
165	1	Bromoform	1.10E-02	mg/kg		2.19E+01	NoA
165	1	Bromomethane	2.10E-02	mg/kg		1.34E-01	NoA
165	1	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
165	1	Cadmium	5.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
165	1	Carbazole	3.60E-01	mg/kg		8.72E+00	NoA
165	1	Carbon disulfide	1.10E-02	mg/kg		1.48E+01	NoA
165	1	Carbon tetrachloride	6.10E-01	mg/kg		2.39E-01	Yes
165	1	Chlorobenzene	6.10E-01	mg/kg		4.07E+00	NoA
165	1	Chloroethane	2.10E-02	mg/kg		1.45E+03	NoA
165	1	Chloroform	6.10E-01	mg/kg		1.22E-01	Yes
165	1	Chloromethane	2.10E-02	mg/kg		1.65E+00	NoA
165	1	cis-1,3-Dichloropropene	1.10E-02	mg/kg			NoC
165	1	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
165	1	Dibromochloromethane	1.10E-02	mg/kg		2.42E-01	NoA
165	1	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
165	1	Dimethyl phthalate	3.70E-01	mg/kg			NoC
165	1	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
165	1	Ethylbenzene	6.10E-01	mg/kg		1.58E+00	NoA
165	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
165	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
165	1	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
165	1	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
165	1	Hexachlorocyclopentadiene	3.70E-01	mg/kg		1.95E+01	NoA
165	1	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
165	1	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
165	1	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
165	1	Methylene chloride	6.10E-01	mg/kg		3.65E+00	NoA
165	1	Molybdenum	4.90E+00	mg/kg		2.30E+01	NoA
165	1	Nitrobenzene	3.70E-01	mg/kg		4.79E+00	NoA
165	1	N-Nitroso-di-n-propylamine	3.70E-01	mg/kg		1.89E-02	Yes
165	1	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
165	1	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
165	1	Phenanthrene	4.90E-01	mg/kg			NoC
165	1	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
165	1	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
165	1	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
165	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
165	1	Styrene	1.10E-02	mg/kg		9.43E+01	NoA
165	1	Tetrachloroethene	6.10E-01	mg/kg		1.13E-01	Yes
165	1	Thallium	1.96E+01	mg/kg	2.10E-01	3.68E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
165	1	Toluene	6.10E-01	mg/kg		9.61E+01	NoA
165	1	Total Xylene	1.20E+00	mg/kg		7.96E+00	NoA
165	1	trans-1,3-Dichloropropene	1.10E-02	mg/kg			NoC
165	1	Trichloroethene	6.10E-01	mg/kg		2.34E-02	Yes
165	1	Vinyl acetate	2.10E-02	mg/kg		1.83E+01	NoA
165	1	Vinyl chloride	2.10E-02	mg/kg		8.24E-02	NoA
170	1	PCB, Total	1.00E-01	mg/kg		6.48E-02	Yes
158	1	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
158	1	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
158	1	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
158	1	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
158	1	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
158	1	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
158	1	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
158	1	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
158	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
158	1	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
158	1	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
158	1	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
158	1	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
158	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
158	1	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
158	1	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
158	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
158	1	2-Nitrophenol	3.70E-01	mg/kg			NoC
158	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
158	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
158	1	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
158	1	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
158	1	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
158	1	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
158	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
158	1	Acenaphthene	3.70E-01	mg/kg		1.17E+02	NoA
158	1	Acenaphthylene	3.70E-01	mg/kg			NoC
158	1	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
158	1	Benzenemethanol	3.70E-01	mg/kg		3.26E+02	NoA
158	1	Benzo(ghi)perylene	3.60E-01	mg/kg			NoC
158	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
158	1	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
158	1	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
158	1	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
158	1	Bis(2-ethylhexyl)phthalate	3.70E-01	mg/kg		1.25E+01	NoA
158	1	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
158	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
158	1	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
158	1	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
158	1	Dimethyl phthalate	3.70E-01	mg/kg			NoC
158	1	Di-n-butyl phthalate	3.70E-01	mg/kg		3.26E+02	NoA
158	1	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
158	1	Fluoranthene	3.60E-01	mg/kg		1.09E+02	NoA
158	1	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
158	1	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
158	1	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
158	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
158	1	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
158	1	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
158	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
158	1	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA
158	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
158	1	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
158	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
158	1	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
158	1	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
158	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
158	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
158	1	Phenanthrene	3.60E-01	mg/kg			NoC
158	1	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
158	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
158	1	Pyrene	3.60E-01	mg/kg		8.12E+01	NoA
158	1	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
158	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
158	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
169	1	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
169	1	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
169	1	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
169	1	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
169	1	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
169	1	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
169	1	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
169	1	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
169	1	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
169	1	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
169	1	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
169	1	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
169	1	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
169	1	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
169	1	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
169	1	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
169	1	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
169	1	2-Nitrophenol	3.80E-01	mg/kg			NoC
169	1	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
169	1	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
169	1	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
169	1	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
169	1	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
169	1	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
169	1	4-Nitrophenol	1.90E+00	mg/kg			NoC
169	1	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
169	1	Acenaphthylene	3.80E-01	mg/kg			NoC
169	1	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
169	1	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
169	1	Bis(2-chloroethyl) ether	7.60E-03	mg/kg		2.14E-01	NoA
169	1	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
169	1	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
169	1	Cadmium	1.10E+00	mg/kg	2.10E-01	8.11E-01	Yes
169	1	Cobalt	9.90E+00	mg/kg	1.40E+01	1.37E+00	NoB
169	1	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
169	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
169	1	Dimethyl phthalate	3.80E-01	mg/kg			NoC
169	1	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
169	1	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
169	1	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
169	1	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
169	1	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
169	1	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
169	1	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
169	1	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
169	1	m,p-Cresol	7.60E-01	mg/kg		3.91E+01	NoA
169	1	Manganese	8.50E+01	mg/kg	1.50E+03	4.19E+02	NoAB
169	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
169	1	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
169	1	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
169	1	N-Nitroso-di-n-propylamine	7.60E-03	mg/kg		1.89E-02	NoA
169	1	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
169	1	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
169	1	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
169	1	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
169	1	Pyridine	7.60E-01	mg/kg		7.82E+00	NoA
169	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
169	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
19	1	Acenaphthene	1.00E+00	mg/kg		1.17E+02	NoA
19	1	Acenaphthylene	1.00E+00	mg/kg			NoC
19	1	Anthracene	6.70E-01	mg/kg		7.47E+02	NoA
19	1	Antimony	9.81E+01	mg/kg	2.10E-01	5.52E-01	Yes
19	1	Chromium	2.96E+01	mg/kg	1.60E+01	1.56E+01	Yes
19	1	Cobalt	4.76E+01	mg/kg	1.40E+01	1.37E+00	Yes
19	1	Fluorene	1.00E+00	mg/kg		9.15E+01	NoA
19	1	Mercury	2.00E-02	mg/kg	2.00E-01	2.13E-01	NoAB
19	1	Naphthalene	6.70E-01	mg/kg		1.15E+00	NoA
19	1	Nickel	1.68E+01	mg/kg	2.10E+01	1.04E+01	NoB
19	1	Selenium	2.50E-01	mg/kg	8.00E-01	2.30E+01	NoAB
19	1	Silver	9.90E+00	mg/kg	2.30E+00	2.61E+00	Yes
19	1	Trichloroethene	5.00E-03	mg/kg		2.34E-02	NoA
138	1	1,1,1-Trichloroethane	1.00E+00	mg/kg		1.46E+02	NoA
138	1	1,2,4-Trichlorobenzene	4.30E-01	mg/kg		7.86E-01	NoA
138	1	1,2-Dichlorobenzene	4.30E-01	mg/kg		2.92E+01	NoA
138	1	1,3-Dichlorobenzene	4.30E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
138	1	1,4-Dichlorobenzene	4.30E-01	mg/kg		8.13E-01	NoA
138	1	2,4,5-Trichlorophenol	4.30E-01	mg/kg		3.26E+02	NoA
138	1	2,4,6-Trichlorophenol	4.30E-01	mg/kg		3.26E+00	NoA
138	1	2,4-Dichlorophenol	4.30E-01	mg/kg		9.78E+00	NoA
138	1	2,4-Dimethylphenol	4.30E-01	mg/kg		6.52E+01	NoA
138	1	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
138	1	2,4-Dinitrotoluene	4.30E-01	mg/kg		5.63E-01	NoA
138	1	2,6-Dinitrotoluene	4.30E-01	mg/kg		3.26E+00	NoA
138	1	2-Chloronaphthalene	4.30E-01	mg/kg		6.26E+02	NoA
138	1	2-Chlorophenol	4.30E-01	mg/kg		3.91E+01	NoA
138	1	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
138	1	2-Methylnaphthalene	4.30E-01	mg/kg		1.30E+01	NoA
138	1	2-Methylphenol	4.30E-01	mg/kg		1.54E+02	NoA
138	1	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
138	1	2-Nitrophenol	4.30E-01	mg/kg			NoC
138	1	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
138	1	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
138	1	4-Bromophenyl phenyl ether	4.30E-01	mg/kg			NoC
138	1	4-Chloro-3-methylphenol	4.30E-01	mg/kg			NoC
138	1	4-Chlorobenzenamine	4.30E-01	mg/kg		8.66E-01	NoA
138	1	4-Chlorophenyl phenyl ether	4.30E-01	mg/kg			NoC
138	1	4-Nitrophenol	2.10E+00	mg/kg			NoC
138	1	Acenaphthene	4.30E-01	mg/kg		1.17E+02	NoA
138	1	Acenaphthylene	4.30E-01	mg/kg			NoC
138	1	Anthracene	4.30E-01	mg/kg		7.47E+02	NoA
138	1	Benzenemethanol	4.30E-01	mg/kg		3.26E+02	NoA
138	1	Benzo(ghi)perylene	4.30E-01	mg/kg			NoC
138	1	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
138	1	Bis(2-chloroethoxy)methane	4.30E-01	mg/kg		9.78E+00	NoA
138	1	Bis(2-chloroethyl) ether	8.60E-03	mg/kg		2.14E-01	NoA
138	1	Bis(2-chloroisopropyl) ether	4.30E-01	mg/kg		4.57E+00	NoA
138	1	Bis(2-ethylhexyl)phthalate	4.30E-01	mg/kg		1.25E+01	NoA
138	1	Butyl benzyl phthalate	4.30E-01	mg/kg		9.18E+01	NoA
138	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
138	1	Dibenzofuran	4.30E-01	mg/kg		3.26E+00	NoA
138	1	Diethyl phthalate	4.30E-01	mg/kg		2.61E+03	NoA
138	1	Dimethyl phthalate	4.30E-01	mg/kg			NoC
138	1	Di-n-butyl phthalate	4.30E-01	mg/kg		3.26E+02	NoA
138	1	Di-n-octylphthalate	4.30E-01	mg/kg		1.30E+02	NoA
138	1	Fluorene	4.30E-01	mg/kg		9.15E+01	NoA
138	1	Hexachlorobenzene	4.30E-01	mg/kg		4.92E-02	Yes
138	1	Hexachlorobutadiene	4.30E-01	mg/kg		2.22E+00	NoA
138	1	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
138	1	Hexachloroethane	4.30E-01	mg/kg		2.28E+00	NoA
138	1	Isophorone	4.30E-01	mg/kg		1.82E+02	NoA
138	1	m,p-Cresol	8.60E-01	mg/kg		3.91E+01	NoA
138	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
138	1	Naphthalene	4.30E-01	mg/kg		1.15E+00	NoA
138	1	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
138	1	N-Nitroso-di-n-propylamine	8.60E-03	mg/kg		1.89E-02	NoA
138	1	N-Nitrosodiphenylamine	4.30E-01	mg/kg		3.22E+01	NoA
138	1	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
138	1	Phenol	4.30E-01	mg/kg		4.98E+02	NoA
138	1	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
138	1	Pyridine	8.60E-01	mg/kg		7.82E+00	NoA
138	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
138	1	Thallium	5.00E+00	mg/kg	2.10E-01	3.68E-01	Yes
138	1	Trichloroethene	1.00E+00	mg/kg		2.34E-02	Yes
138	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
138	2	1,1-Dichloroethene	1.00E+00	mg/kg		2.37E-02	Yes
138	2	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
138	2	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
138	2	1,2-Dichloroethane	1.00E+00	mg/kg		1.55E-01	Yes
138	2	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
138	2	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
138	2	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
138	2	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
138	2	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
138	2	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
138	2	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
138	2	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
138	2	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
138	2	2-Butanone	1.10E+00	mg/kg		5.78E+02	NoA
138	2	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
138	2	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
138	2	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
138	2	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
138	2	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
138	2	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
138	2	2-Nitrophenol	3.80E-01	mg/kg			NoC
138	2	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
138	2	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
138	2	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
138	2	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
138	2	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
138	2	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
138	2	4-Nitrophenol	1.80E+00	mg/kg			NoC
138	2	Acenaphthene	2.50E+00	mg/kg		1.17E+02	NoA
138	2	Acenaphthylene	2.50E+00	mg/kg			NoC
138	2	Anthracene	2.50E+00	mg/kg		7.47E+02	NoA
138	2	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
138	2	Benzene	1.00E+00	mg/kg		3.33E-01	Yes
138	2	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
138	2	Benzo(ghi)perylene	2.50E+00	mg/kg			NoC
138	2	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
138	2	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
138	2	Bis(2-chloroethyl) ether	7.60E-03	mg/kg		2.14E-01	NoA
138	2	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
138	2	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
138	2	Carbon tetrachloride	1.00E+00	mg/kg		2.39E-01	Yes
138	2	Chlorobenzene	1.00E+00	mg/kg		4.07E+00	NoA
138	2	Chloroform	1.00E+00	mg/kg		1.22E-01	Yes
138	2	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
138	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
138	2	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
138	2	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
138	2	Dimethyl phthalate	3.80E-01	mg/kg			NoC
138	2	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
138	2	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
138	2	Fluoranthene	2.50E+00	mg/kg		1.09E+02	NoA
138	2	Fluorene	2.50E+00	mg/kg		9.15E+01	NoA
138	2	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
138	2	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
138	2	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
138	2	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
138	2	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
138	2	m,p-Cresol	7.60E-01	mg/kg		3.91E+01	NoA
138	2	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
138	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
138	2	Naphthalene	2.50E+00	mg/kg		1.15E+00	Yes
138	2	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
138	2	N-Nitroso-di-n-propylamine	7.60E-03	mg/kg		1.89E-02	NoA
138	2	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
138	2	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
138	2	Phenanthrene	2.50E+00	mg/kg			NoC
138	2	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
138	2	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
138	2	Pyrene	2.50E+00	mg/kg		8.12E+01	NoA
138	2	Pyridine	7.60E-01	mg/kg		7.82E+00	NoA
138	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
138	2	Tetrachloroethene	1.00E+00	mg/kg		1.13E-01	Yes
138	2	Trichloroethene	1.00E+00	mg/kg		2.34E-02	Yes
138	2	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
138	2	Vinyl chloride	1.10E+00	mg/kg		8.24E-02	Yes
180	1	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
180	1	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
180	1	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
180	1	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
180	1	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
180	1	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
180	1	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
180	1	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
180	1	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
180	1	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
180	1	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
180	1	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
180	1	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
180	1	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
180	1	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
180	1	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
180	1	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
180	1	2-Nitrophenol	4.20E-01	mg/kg			NoC
180	1	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
180	1	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
180	1	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
180	1	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
180	1	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
180	1	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
180	1	4-Nitrophenol	2.10E+00	mg/kg			NoC
180	1	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
180	1	Acenaphthylene	4.20E-01	mg/kg			NoC
180	1	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
180	1	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
180	1	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
180	1	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
180	1	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
180	1	Bis(2-chloroethyl) ether	8.50E-03	mg/kg		2.14E-01	NoA
180	1	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
180	1	Bis(2-ethylhexyl)phthalate	4.20E-01	mg/kg		1.25E+01	NoA
180	1	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
180	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
180	1	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
180	1	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
180	1	Dimethyl phthalate	4.20E-01	mg/kg			NoC
180	1	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
180	1	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
180	1	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
180	1	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
180	1	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
180	1	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
180	1	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
180	1	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
180	1	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
180	1	m,p-Cresol	8.50E-01	mg/kg		3.91E+01	NoA
180	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
180	1	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
180	1	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
180	1	N-Nitroso-di-n-propylamine	8.50E-03	mg/kg		1.89E-02	NoA
180	1	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
180	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
180	1	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
180	1	Phenanthrene	4.20E-01	mg/kg			NoC
180	1	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
180	1	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
180	1	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
180	1	Pyridine	8.50E-01	mg/kg		7.82E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
180	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
180	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
180	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
180	2	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
180	2	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
180	2	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
180	2	1,4-Dichlorobenzene	4.40E-01	mg/kg		8.13E-01	NoA
180	2	2,4,5-Trichlorophenol	4.40E-01	mg/kg		3.26E+02	NoA
180	2	2,4,6-Trichlorophenol	4.40E-01	mg/kg		3.26E+00	NoA
180	2	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
180	2	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
180	2	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
180	2	2,4-Dinitrotoluene	4.40E-01	mg/kg		5.63E-01	NoA
180	2	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
180	2	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA
180	2	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
180	2	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
180	2	2-Methylnaphthalene	4.40E-01	mg/kg		1.30E+01	NoA
180	2	2-Methylphenol	4.40E-01	mg/kg		1.54E+02	NoA
180	2	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
180	2	2-Nitrophenol	4.40E-01	mg/kg			NoC
180	2	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
180	2	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
180	2	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
180	2	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
180	2	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
180	2	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
180	2	4-Nitrophenol	2.10E+00	mg/kg			NoC
180	2	Acenaphthene	4.40E-01	mg/kg		1.17E+02	NoA
180	2	Acenaphthylene	4.40E-01	mg/kg			NoC
180	2	Anthracene	4.40E-01	mg/kg		7.47E+02	NoA
180	2	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
180	2	Benzo(ghi)perylene	4.40E-01	mg/kg			NoC
180	2	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
180	2	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
180	2	Bis(2-chloroethyl) ether	8.90E-03	mg/kg		2.14E-01	NoA
180	2	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA
180	2	Bis(2-ethylhexyl)phthalate	4.40E-01	mg/kg		1.25E+01	NoA
180	2	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
180	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
180	2	Dibenzofuran	4.40E-01	mg/kg		3.26E+00	NoA
180	2	Diethyl phthalate	4.40E-01	mg/kg		2.61E+03	NoA
180	2	Dimethyl phthalate	4.40E-01	mg/kg			NoC
180	2	Di-n-butyl phthalate	4.40E-01	mg/kg		3.26E+02	NoA
180	2	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA
180	2	Fluorene	4.40E-01	mg/kg		9.15E+01	NoA
180	2	Hexachlorobenzene	4.40E-01	mg/kg		4.92E-02	Yes
180	2	Hexachlorobutadiene	4.40E-01	mg/kg		2.22E+00	NoA
180	2	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
180	2	Hexachloroethane	4.40E-01	mg/kg		2.28E+00	NoA
180	2	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
180	2	m,p-Cresol	8.90E-01	mg/kg		3.91E+01	NoA
180	2	Manganese	8.50E+01	mg/kg	1.50E+03	4.19E+02	NoAB
180	2	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
180	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
180	2	Naphthalene	4.40E-01	mg/kg		1.15E+00	NoA
180	2	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
180	2	N-Nitroso-di-n-propylamine	8.90E-03	mg/kg		1.89E-02	NoA
180	2	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
180	2	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
180	2	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
180	2	Phenanthrene	4.40E-01	mg/kg			NoC
180	2	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
180	2	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
180	2	Pyridine	8.90E-01	mg/kg		7.82E+00	NoA
180	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
180	2	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
180	2	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
180	3	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
180	3	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
180	3	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
180	3	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
180	3	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
180	3	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
180	3	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
180	3	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
180	3	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
180	3	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
180	3	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
180	3	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
180	3	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
180	3	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
180	3	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
180	3	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
180	3	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
180	3	2-Nitrophenol	3.90E-01	mg/kg			NoC
180	3	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
180	3	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
180	3	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
180	3	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
180	3	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
180	3	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
180	3	4-Nitrophenol	1.90E+00	mg/kg			NoC
180	3	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
180	3	Acenaphthylene	3.90E-01	mg/kg			NoC
180	3	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
180	3	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
180	3	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
180	3	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
180	3	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
180	3	Bis(2-chloroethyl) ether	7.80E-03	mg/kg		2.14E-01	NoA
180	3	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
180	3	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
180	3	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
180	3	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
180	3	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
180	3	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
180	3	Dimethyl phthalate	3.90E-01	mg/kg			NoC
180	3	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
180	3	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
180	3	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
180	3	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
180	3	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
180	3	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
180	3	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
180	3	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
180	3	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
180	3	m,p-Cresol	7.80E-01	mg/kg		3.91E+01	NoA
180	3	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
180	3	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
180	3	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
180	3	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
180	3	N-Nitroso-di-n-propylamine	7.80E-03	mg/kg		1.89E-02	NoA
180	3	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
180	3	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
180	3	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
180	3	Phenanthrene	3.90E-01	mg/kg			NoC
180	3	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
180	3	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
180	3	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
180	3	Pyridine	7.80E-01	mg/kg		7.82E+00	NoA
180	3	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
180	3	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
180	4	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
180	4	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
180	4	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
180	4	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
180	4	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
180	4	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
180	4	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
180	4	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
180	4	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
180	4	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
180	4	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
180	4	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
180	4	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
180	4	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
180	4	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA
180	4	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
180	4	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
180	4	2-Nitrophenol	3.90E-01	mg/kg			NoC
180	4	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
180	4	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
180	4	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
180	4	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
180	4	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
180	4	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
180	4	4-Nitrophenol	1.90E+00	mg/kg			NoC
180	4	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
180	4	Acenaphthylene	3.90E-01	mg/kg			NoC
180	4	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
180	4	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
180	4	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC
180	4	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
180	4	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
180	4	Bis(2-chloroethyl) ether	7.90E-03	mg/kg		2.14E-01	NoA
180	4	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
180	4	Bis(2-ethylhexyl)phthalate	3.90E-01	mg/kg		1.25E+01	NoA
180	4	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
180	4	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
180	4	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
180	4	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
180	4	Dimethyl phthalate	3.90E-01	mg/kg			NoC
180	4	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
180	4	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
180	4	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
180	4	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
180	4	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
180	4	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
180	4	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
180	4	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
180	4	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
180	4	m,p-Cresol	7.90E-01	mg/kg		3.91E+01	NoA
180	4	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
180	4	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
180	4	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
180	4	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
180	4	N-Nitroso-di-n-propylamine	7.90E-03	mg/kg		1.89E-02	NoA
180	4	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
180	4	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
180	4	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
180	4	Phenanthrene	3.90E-01	mg/kg			NoC
180	4	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
180	4	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
180	4	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
180	4	Pyridine	7.90E-01	mg/kg		7.82E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
180	4	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
180	4	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
181	1	Acenaphthene	8.10E-03	mg/kg		1.17E+02	NoA
181	1	Acenaphthylene	8.10E-03	mg/kg			NoC
181	1	Anthracene	8.10E-03	mg/kg		7.47E+02	NoA
181	1	Antimony	8.34E+00	mg/kg	2.10E-01	5.52E-01	Yes
181	1	Arsenic	4.97E+00	mg/kg	1.20E+01	2.38E-01	NoB
181	1	Beryllium	4.97E-01	mg/kg	6.70E-01	5.67E-03	NoB
181	1	Cadmium	2.49E+00	mg/kg	2.10E-01	8.11E-01	Yes
181	1	Fluorene	8.10E-03	mg/kg		9.15E+01	NoA
181	1	Molybdenum	4.97E+00	mg/kg		2.30E+01	NoA
181	1	PCB, Total	1.30E-01	mg/kg		6.48E-02	Yes
181	1	PCB, Total	2.00E-02	mg/kg		6.62E-02	NoA
181	1	Selenium	4.97E+00	mg/kg	8.00E-01	2.30E+01	NoA
181	1	Silver	2.08E+00	mg/kg	2.30E+00	2.61E+00	NoAB
181	1	Sodium	1.99E+02	mg/kg	3.20E+02		NoBE
181	1	Uranium	4.97E+00	mg/kg	4.90E+00	1.38E+01	NoA
195	1	1,2,4-Trichlorobenzene	4.50E-01	mg/kg		7.86E-01	NoA
195	1	1,2-Dichlorobenzene	4.50E-01	mg/kg		2.92E+01	NoA
195	1	1,3-Dichlorobenzene	4.50E-01	mg/kg			NoC
195	1	1,4-Dichlorobenzene	4.50E-01	mg/kg		8.13E-01	NoA
195	1	2,4,5-Trichlorophenol	4.50E-01	mg/kg		3.26E+02	NoA
195	1	2,4,6-Trichlorophenol	4.50E-01	mg/kg		3.26E+00	NoA
195	1	2,4-Dichlorophenol	4.50E-01	mg/kg		9.78E+00	NoA
195	1	2,4-Dimethylphenol	4.50E-01	mg/kg		6.52E+01	NoA
195	1	2,4-Dinitrophenol	2.20E+00	mg/kg		6.52E+00	NoA
195	1	2,4-Dinitrotoluene	4.50E-01	mg/kg		5.63E-01	NoA
195	1	2,6-Dinitrotoluene	4.50E-01	mg/kg		3.26E+00	NoA
195	1	2-Chloronaphthalene	4.50E-01	mg/kg		6.26E+02	NoA
195	1	2-Chlorophenol	4.50E-01	mg/kg		3.91E+01	NoA
195	1	2-Methyl-4,6-dinitrophenol	2.20E+00	mg/kg		2.61E-01	Yes
195	1	2-Methylnaphthalene	4.50E-01	mg/kg		1.30E+01	NoA
195	1	2-Methylphenol	4.50E-01	mg/kg		1.54E+02	NoA
195	1	2-Nitrobenzenamine	2.20E+00	mg/kg		2.96E-01	Yes
195	1	2-Nitrophenol	4.50E-01	mg/kg			NoC
195	1	3,3'-Dichlorobenzidine	2.20E+00	mg/kg		3.85E-01	Yes
195	1	3-Nitrobenzenamine	2.20E+00	mg/kg		9.78E-01	Yes
195	1	4-Bromophenyl phenyl ether	4.50E-01	mg/kg			NoC
195	1	4-Chloro-3-methylphenol	4.50E-01	mg/kg			NoC
195	1	4-Chlorobenzenamine	4.50E-01	mg/kg		8.66E-01	NoA
195	1	4-Chlorophenyl phenyl ether	4.50E-01	mg/kg			NoC
195	1	4-Nitrophenol	2.20E+00	mg/kg			NoC
195	1	Acenaphthene	4.50E-01	mg/kg		1.17E+02	NoA
195	1	Acenaphthylene	4.50E-01	mg/kg			NoC
195	1	Anthracene	4.50E-01	mg/kg		7.47E+02	NoA
195	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	1	Benzenemethanol	4.50E-01	mg/kg		3.26E+02	NoA
195	1	Benzo(ghi)perylene	4.50E-01	mg/kg			NoC
195	1	Benzoic acid	2.20E+00	mg/kg		1.30E+04	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	1	Bis(2-chloroethoxy)methane	4.50E-01	mg/kg		9.78E+00	NoA
195	1	Bis(2-chloroethyl) ether	9.00E-03	mg/kg		2.14E-01	NoA
195	1	Bis(2-chloroisopropyl) ether	4.50E-01	mg/kg		4.57E+00	NoA
195	1	Bis(2-ethylhexyl)phthalate	4.50E-01	mg/kg		1.25E+01	NoA
195	1	Butyl benzyl phthalate	4.50E-01	mg/kg		9.18E+01	NoA
195	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	1	Dibenzofuran	4.50E-01	mg/kg		3.26E+00	NoA
195	1	Diethyl phthalate	4.50E-01	mg/kg		2.61E+03	NoA
195	1	Dimethyl phthalate	4.50E-01	mg/kg			NoC
195	1	Di-n-butyl phthalate	4.50E-01	mg/kg		3.26E+02	NoA
195	1	Di-n-octylphthalate	4.50E-01	mg/kg		1.30E+02	NoA
195	1	Fluoranthene	4.50E-01	mg/kg		1.09E+02	NoA
195	1	Fluorene	4.50E-01	mg/kg		9.15E+01	NoA
195	1	Hexachlorobenzene	4.50E-01	mg/kg		4.92E-02	Yes
195	1	Hexachlorobutadiene	4.50E-01	mg/kg		2.22E+00	NoA
195	1	Hexachlorocyclopentadiene	2.20E+00	mg/kg		1.95E+01	NoA
195	1	Hexachloroethane	4.50E-01	mg/kg		2.28E+00	NoA
195	1	Isophorone	4.50E-01	mg/kg		1.82E+02	NoA
195	1	m,p-Cresol	9.00E-01	mg/kg		3.91E+01	NoA
195	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	1	Naphthalene	4.50E-01	mg/kg		1.15E+00	NoA
195	1	Nitrobenzene	2.20E+00	mg/kg		4.79E+00	NoA
195	1	N-Nitroso-di-n-propylamine	9.00E-03	mg/kg		1.89E-02	NoA
195	1	N-Nitrosodiphenylamine	4.50E-01	mg/kg		3.22E+01	NoA
195	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	1	Pentachlorophenol	2.20E+00	mg/kg		4.36E-01	Yes
195	1	Phenanthrene	4.50E-01	mg/kg			NoC
195	1	Phenol	4.50E-01	mg/kg		4.98E+02	NoA
195	1	p-Nitroaniline	2.20E+00	mg/kg		8.66E+00	NoA
195	1	Pyrene	4.50E-01	mg/kg		8.12E+01	NoA
195	1	Pyridine	9.00E-01	mg/kg		7.82E+00	NoA
195	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	2	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
195	2	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
195	2	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
195	2	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
195	2	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
195	2	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
195	2	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
195	2	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
195	2	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
195	2	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
195	2	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
195	2	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
195	2	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
195	2	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
195	2	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	2	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
195	2	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
195	2	2-Nitrophenol	4.10E-01	mg/kg			NoC
195	2	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
195	2	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
195	2	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
195	2	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
195	2	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
195	2	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
195	2	4-Nitrophenol	2.00E+00	mg/kg			NoC
195	2	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
195	2	Acenaphthylene	4.10E-01	mg/kg			NoC
195	2	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
195	2	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	2	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
195	2	Benzo(ghi)perylene	4.10E-01	mg/kg			NoC
195	2	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
195	2	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
195	2	Bis(2-chloroethyl) ether	8.30E-03	mg/kg		2.14E-01	NoA
195	2	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
195	2	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
195	2	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
195	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	2	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
195	2	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
195	2	Dimethyl phthalate	4.10E-01	mg/kg			NoC
195	2	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
195	2	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
195	2	Fluoranthene	4.10E-01	mg/kg		1.09E+02	NoA
195	2	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
195	2	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
195	2	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
195	2	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
195	2	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
195	2	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
195	2	m,p-Cresol	8.30E-01	mg/kg		3.91E+01	NoA
195	2	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	2	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
195	2	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
195	2	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
195	2	N-Nitroso-di-n-propylamine	8.30E-03	mg/kg		1.89E-02	NoA
195	2	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
195	2	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	2	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
195	2	Phenanthrene	4.10E-01	mg/kg			NoC
195	2	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
195	2	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
195	2	Pyrene	4.10E-01	mg/kg		8.12E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	2	Pyridine	8.30E-01	mg/kg		7.82E+00	NoA
195	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	2	Thallium	2.50E-01	mg/kg	2.10E-01	3.68E-01	NoA
195	2	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	2	Zinc	2.50E+01	mg/kg	6.50E+01	1.38E+03	NoAB
195	3	1,2,4-Trichlorobenzene	4.30E-01	mg/kg		7.86E-01	NoA
195	3	1,2-Dichlorobenzene	4.30E-01	mg/kg		2.92E+01	NoA
195	3	1,3-Dichlorobenzene	4.30E-01	mg/kg			NoC
195	3	1,4-Dichlorobenzene	4.30E-01	mg/kg		8.13E-01	NoA
195	3	2,4,5-Trichlorophenol	4.30E-01	mg/kg		3.26E+02	NoA
195	3	2,4,6-Trichlorophenol	4.30E-01	mg/kg		3.26E+00	NoA
195	3	2,4-Dichlorophenol	4.30E-01	mg/kg		9.78E+00	NoA
195	3	2,4-Dimethylphenol	4.30E-01	mg/kg		6.52E+01	NoA
195	3	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
195	3	2,4-Dinitrotoluene	4.30E-01	mg/kg		5.63E-01	NoA
195	3	2,6-Dinitrotoluene	4.30E-01	mg/kg		3.26E+00	NoA
195	3	2-Chloronaphthalene	4.30E-01	mg/kg		6.26E+02	NoA
195	3	2-Chlorophenol	4.30E-01	mg/kg		3.91E+01	NoA
195	3	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
195	3	2-Methylnaphthalene	4.30E-01	mg/kg		1.30E+01	NoA
195	3	2-Methylphenol	4.30E-01	mg/kg		1.54E+02	NoA
195	3	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
195	3	2-Nitrophenol	4.30E-01	mg/kg			NoC
195	3	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
195	3	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
195	3	4-Bromophenyl phenyl ether	4.30E-01	mg/kg			NoC
195	3	4-Chloro-3-methylphenol	4.30E-01	mg/kg			NoC
195	3	4-Chlorobenzenamine	4.30E-01	mg/kg		8.66E-01	NoA
195	3	4-Chlorophenyl phenyl ether	4.30E-01	mg/kg			NoC
195	3	4-Nitrophenol	2.10E+00	mg/kg			NoC
195	3	Acenaphthene	4.30E-01	mg/kg		1.17E+02	NoA
195	3	Acenaphthylene	4.30E-01	mg/kg			NoC
195	3	Anthracene	4.30E-01	mg/kg		7.47E+02	NoA
195	3	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	3	Benzenemethanol	4.30E-01	mg/kg		3.26E+02	NoA
195	3	Benzo(ghi)perylene	4.30E-01	mg/kg			NoC
195	3	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
195	3	Bis(2-chloroethoxy)methane	4.30E-01	mg/kg		9.78E+00	NoA
195	3	Bis(2-chloroethyl) ether	8.60E-03	mg/kg		2.14E-01	NoA
195	3	Bis(2-chloroisopropyl) ether	4.30E-01	mg/kg		4.57E+00	NoA
195	3	Bis(2-ethylhexyl)phthalate	4.30E-01	mg/kg		1.25E+01	NoA
195	3	Butyl benzyl phthalate	4.30E-01	mg/kg		9.18E+01	NoA
195	3	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	3	Dibenzofuran	4.30E-01	mg/kg		3.26E+00	NoA
195	3	Diethyl phthalate	4.30E-01	mg/kg		2.61E+03	NoA
195	3	Dimethyl phthalate	4.30E-01	mg/kg			NoC
195	3	Di-n-butyl phthalate	4.30E-01	mg/kg		3.26E+02	NoA
195	3	Di-n-octylphthalate	4.30E-01	mg/kg		1.30E+02	NoA
195	3	Fluorene	4.30E-01	mg/kg		9.15E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	3	Hexachlorobenzene	4.30E-01	mg/kg		4.92E-02	Yes
195	3	Hexachlorobutadiene	4.30E-01	mg/kg		2.22E+00	NoA
195	3	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
195	3	Hexachloroethane	4.30E-01	mg/kg		2.28E+00	NoA
195	3	Isophorone	4.30E-01	mg/kg		1.82E+02	NoA
195	3	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	3	m,p-Cresol	8.60E-01	mg/kg		3.91E+01	NoA
195	3	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	3	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	3	Naphthalene	4.30E-01	mg/kg		1.15E+00	NoA
195	3	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
195	3	N-Nitroso-di-n-propylamine	8.60E-03	mg/kg		1.89E-02	NoA
195	3	N-Nitrosodiphenylamine	4.30E-01	mg/kg		3.22E+01	NoA
195	3	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	3	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
195	3	Phenanthrene	4.30E-01	mg/kg			NoC
195	3	Phenol	4.30E-01	mg/kg		4.98E+02	NoA
195	3	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
195	3	Pyridine	8.60E-01	mg/kg		7.82E+00	NoA
195	3	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	3	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	3	Thallium	2.60E-01	mg/kg	2.10E-01	3.68E-01	NoA
195	3	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	4	1,2,4-Trichlorobenzene	4.50E-01	mg/kg		7.86E-01	NoA
195	4	1,2-Dichlorobenzene	4.50E-01	mg/kg		2.92E+01	NoA
195	4	1,3-Dichlorobenzene	4.50E-01	mg/kg			NoC
195	4	1,4-Dichlorobenzene	4.50E-01	mg/kg		8.13E-01	NoA
195	4	2,4,5-Trichlorophenol	4.50E-01	mg/kg		3.26E+02	NoA
195	4	2,4,6-Trichlorophenol	4.50E-01	mg/kg		3.26E+00	NoA
195	4	2,4-Dichlorophenol	4.50E-01	mg/kg		9.78E+00	NoA
195	4	2,4-Dimethylphenol	4.50E-01	mg/kg		6.52E+01	NoA
195	4	2,4-Dinitrophenol	2.20E+00	mg/kg		6.52E+00	NoA
195	4	2,4-Dinitrotoluene	4.50E-01	mg/kg		5.63E-01	NoA
195	4	2,6-Dinitrotoluene	4.50E-01	mg/kg		3.26E+00	NoA
195	4	2-Chloronaphthalene	4.50E-01	mg/kg		6.26E+02	NoA
195	4	2-Chlorophenol	4.50E-01	mg/kg		3.91E+01	NoA
195	4	2-Methyl-4,6-dinitrophenol	2.20E+00	mg/kg		2.61E-01	Yes
195	4	2-Methylnaphthalene	4.50E-01	mg/kg		1.30E+01	NoA
195	4	2-Methylphenol	4.50E-01	mg/kg		1.54E+02	NoA
195	4	2-Nitrobenzenamine	2.20E+00	mg/kg		2.96E-01	Yes
195	4	2-Nitrophenol	4.50E-01	mg/kg			NoC
195	4	3,3'-Dichlorobenzidine	2.20E+00	mg/kg		3.85E-01	Yes
195	4	3-Nitrobenzenamine	2.20E+00	mg/kg		9.78E-01	Yes
195	4	4-Bromophenyl phenyl ether	4.50E-01	mg/kg			NoC
195	4	4-Chloro-3-methylphenol	4.50E-01	mg/kg			NoC
195	4	4-Chlorobenzenamine	4.50E-01	mg/kg		8.66E-01	NoA
195	4	4-Chlorophenyl phenyl ether	4.50E-01	mg/kg			NoC
195	4	4-Nitrophenol	2.20E+00	mg/kg			NoC
195	4	Acenaphthene	4.50E-01	mg/kg		1.17E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	4	Acenaphthylene	4.50E-01	mg/kg			NoC
195	4	Anthracene	4.50E-01	mg/kg		7.47E+02	NoA
195	4	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	4	Benzenemethanol	4.50E-01	mg/kg		3.26E+02	NoA
195	4	Benzo(ghi)perylene	4.50E-01	mg/kg			NoC
195	4	Benzoic acid	2.20E+00	mg/kg		1.30E+04	NoA
195	4	Bis(2-chloroethoxy)methane	4.50E-01	mg/kg		9.78E+00	NoA
195	4	Bis(2-chloroethyl) ether	8.90E-03	mg/kg		2.14E-01	NoA
195	4	Bis(2-chloroisopropyl) ether	4.50E-01	mg/kg		4.57E+00	NoA
195	4	Bis(2-ethylhexyl)phthalate	4.50E-01	mg/kg		1.25E+01	NoA
195	4	Butyl benzyl phthalate	4.50E-01	mg/kg		9.18E+01	NoA
195	4	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	4	Dibenzofuran	4.50E-01	mg/kg		3.26E+00	NoA
195	4	Diethyl phthalate	4.50E-01	mg/kg		2.61E+03	NoA
195	4	Dimethyl phthalate	4.50E-01	mg/kg			NoC
195	4	Di-n-butyl phthalate	4.50E-01	mg/kg		3.26E+02	NoA
195	4	Di-n-octylphthalate	4.50E-01	mg/kg		1.30E+02	NoA
195	4	Fluoranthene	4.50E-01	mg/kg		1.09E+02	NoA
195	4	Fluorene	4.50E-01	mg/kg		9.15E+01	NoA
195	4	Hexachlorobenzene	4.50E-01	mg/kg		4.92E-02	Yes
195	4	Hexachlorobutadiene	4.50E-01	mg/kg		2.22E+00	NoA
195	4	Hexachlorocyclopentadiene	2.20E+00	mg/kg		1.95E+01	NoA
195	4	Hexachloroethane	4.50E-01	mg/kg		2.28E+00	NoA
195	4	Isophorone	4.50E-01	mg/kg		1.82E+02	NoA
195	4	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	4	m,p-Cresol	8.90E-01	mg/kg		3.91E+01	NoA
195	4	Manganese	8.50E+01	mg/kg	1.50E+03	4.19E+02	NoAB
195	4	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	4	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	4	Naphthalene	4.50E-01	mg/kg		1.15E+00	NoA
195	4	Nitrobenzene	2.20E+00	mg/kg		4.79E+00	NoA
195	4	N-Nitroso-di-n-propylamine	8.90E-03	mg/kg		1.89E-02	NoA
195	4	N-Nitrosodiphenylamine	4.50E-01	mg/kg		3.22E+01	NoA
195	4	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	4	Pentachlorophenol	2.20E+00	mg/kg		4.36E-01	Yes
195	4	Phenanthrene	4.50E-01	mg/kg			NoC
195	4	Phenol	4.50E-01	mg/kg		4.98E+02	NoA
195	4	p-Nitroaniline	2.20E+00	mg/kg		8.66E+00	NoA
195	4	Pyrene	4.50E-01	mg/kg		8.12E+01	NoA
195	4	Pyridine	8.90E-01	mg/kg		7.82E+00	NoA
195	4	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	4	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	4	Thallium	2.70E-01	mg/kg	2.10E-01	3.68E-01	NoA
195	4	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	5	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
195	5	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
195	5	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
195	5	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
195	5	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	5	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
195	5	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
195	5	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
195	5	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
195	5	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
195	5	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
195	5	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
195	5	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
195	5	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
195	5	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
195	5	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
195	5	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
195	5	2-Nitrophenol	4.20E-01	mg/kg			NoC
195	5	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
195	5	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
195	5	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	5	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
195	5	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
195	5	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	5	4-Nitrophenol	2.00E+00	mg/kg			NoC
195	5	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
195	5	Acenaphthylene	4.20E-01	mg/kg			NoC
195	5	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
195	5	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	5	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
195	5	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
195	5	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
195	5	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
195	5	Bis(2-chloroethyl) ether	8.30E-03	mg/kg		2.14E-01	NoA
195	5	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
195	5	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
195	5	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
195	5	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	5	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
195	5	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
195	5	Dimethyl phthalate	4.20E-01	mg/kg			NoC
195	5	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
195	5	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
195	5	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
195	5	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
195	5	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
195	5	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
195	5	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
195	5	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
195	5	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	5	m,p-Cresol	8.30E-01	mg/kg		3.91E+01	NoA
195	5	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	5	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	5	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	5	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
195	5	N-Nitroso-di-n-propylamine	8.30E-03	mg/kg		1.89E-02	NoA
195	5	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
195	5	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	5	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
195	5	Phenanthrene	4.00E-01	mg/kg			NoC
195	5	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
195	5	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
195	5	Pyridine	8.30E-01	mg/kg		7.82E+00	NoA
195	5	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	5	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	5	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	6	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
195	6	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
195	6	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
195	6	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
195	6	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
195	6	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
195	6	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
195	6	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
195	6	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
195	6	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
195	6	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
195	6	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
195	6	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
195	6	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
195	6	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
195	6	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
195	6	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
195	6	2-Nitrophenol	4.20E-01	mg/kg			NoC
195	6	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
195	6	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
195	6	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	6	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
195	6	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
195	6	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	6	4-Nitrophenol	2.00E+00	mg/kg			NoC
195	6	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
195	6	Acenaphthylene	4.20E-01	mg/kg			NoC
195	6	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	6	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
195	6	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
195	6	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
195	6	Bis(2-chloroethyl) ether	8.40E-03	mg/kg		2.14E-01	NoA
195	6	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
195	6	Bis(2-ethylhexyl)phthalate	4.20E-01	mg/kg		1.25E+01	NoA
195	6	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
195	6	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	6	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	6	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
195	6	Dimethyl phthalate	4.20E-01	mg/kg			NoC
195	6	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
195	6	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
195	6	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
195	6	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
195	6	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
195	6	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
195	6	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
195	6	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
195	6	m,p-Cresol	8.40E-01	mg/kg		3.91E+01	NoA
195	6	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	6	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	6	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
195	6	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
195	6	N-Nitroso-di-n-propylamine	8.40E-03	mg/kg		1.89E-02	NoA
195	6	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
195	6	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	6	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
195	6	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
195	6	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
195	6	Pyridine	8.40E-01	mg/kg		7.82E+00	NoA
195	6	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	6	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	6	Thallium	2.50E-01	mg/kg	2.10E-01	3.68E-01	NoA
195	6	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	7	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
195	7	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
195	7	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
195	7	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
195	7	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
195	7	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
195	7	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
195	7	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
195	7	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
195	7	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
195	7	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
195	7	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
195	7	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
195	7	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
195	7	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
195	7	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
195	7	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
195	7	2-Nitrophenol	4.20E-01	mg/kg			NoC
195	7	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
195	7	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
195	7	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	7	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
195	7	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	7	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	7	4-Nitrophenol	2.00E+00	mg/kg			NoC
195	7	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
195	7	Acenaphthylene	4.20E-01	mg/kg			NoC
195	7	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
195	7	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	7	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
195	7	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
195	7	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
195	7	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
195	7	Bis(2-chloroethyl) ether	8.40E-03	mg/kg		2.14E-01	NoA
195	7	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
195	7	Bis(2-ethylhexyl)phthalate	4.20E-01	mg/kg		1.25E+01	NoA
195	7	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
195	7	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	7	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
195	7	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
195	7	Dimethyl phthalate	4.20E-01	mg/kg			NoC
195	7	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
195	7	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
195	7	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
195	7	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
195	7	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
195	7	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
195	7	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
195	7	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
195	7	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
195	7	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	7	m,p-Cresol	8.40E-01	mg/kg		3.91E+01	NoA
195	7	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	7	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	7	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
195	7	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
195	7	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
195	7	N-Nitroso-di-n-propylamine	8.40E-03	mg/kg		1.89E-02	NoA
195	7	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
195	7	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	7	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
195	7	Phenanthrene	4.20E-01	mg/kg			NoC
195	7	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
195	7	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
195	7	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
195	7	Pyridine	8.40E-01	mg/kg		7.82E+00	NoA
195	7	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	7	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	8	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
195	8	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
195	8	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
195	8	1,4-Dichlorobenzene	4.40E-01	mg/kg		8.13E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	8	2,4,5-Trichlorophenol	4.40E-01	mg/kg		3.26E+02	NoA
195	8	2,4,6-Trichlorophenol	4.40E-01	mg/kg		3.26E+00	NoA
195	8	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
195	8	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
195	8	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
195	8	2,4-Dinitrotoluene	4.40E-01	mg/kg		5.63E-01	NoA
195	8	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
195	8	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA
195	8	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
195	8	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
195	8	2-Methylnaphthalene	4.40E-01	mg/kg		1.30E+01	NoA
195	8	2-Methylphenol	4.40E-01	mg/kg		1.54E+02	NoA
195	8	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
195	8	2-Nitrophenol	4.40E-01	mg/kg			NoC
195	8	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
195	8	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
195	8	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
195	8	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
195	8	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
195	8	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
195	8	4-Nitrophenol	2.10E+00	mg/kg			NoC
195	8	Acenaphthene	4.40E-01	mg/kg		1.17E+02	NoA
195	8	Acenaphthylene	4.40E-01	mg/kg			NoC
195	8	Anthracene	4.40E-01	mg/kg		7.47E+02	NoA
195	8	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
195	8	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
195	8	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
195	8	Bis(2-chloroethyl) ether	8.80E-03	mg/kg		2.14E-01	NoA
195	8	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA
195	8	Bis(2-ethylhexyl)phthalate	4.40E-01	mg/kg		1.25E+01	NoA
195	8	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
195	8	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	8	Dibenzofuran	4.40E-01	mg/kg		3.26E+00	NoA
195	8	Diethyl phthalate	4.40E-01	mg/kg		2.61E+03	NoA
195	8	Dimethyl phthalate	4.40E-01	mg/kg			NoC
195	8	Di-n-butyl phthalate	4.40E-01	mg/kg		3.26E+02	NoA
195	8	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA
195	8	Fluorene	4.40E-01	mg/kg		9.15E+01	NoA
195	8	Hexachlorobenzene	4.40E-01	mg/kg		4.92E-02	Yes
195	8	Hexachlorobutadiene	4.40E-01	mg/kg		2.22E+00	NoA
195	8	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
195	8	Hexachloroethane	4.40E-01	mg/kg		2.28E+00	NoA
195	8	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
195	8	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	8	m,p-Cresol	8.80E-01	mg/kg		3.91E+01	NoA
195	8	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	8	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	8	Naphthalene	4.40E-01	mg/kg		1.15E+00	NoA
195	8	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	8	N-Nitroso-di-n-propylamine	8.80E-03	mg/kg		1.89E-02	NoA
195	8	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
195	8	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	8	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
195	8	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
195	8	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
195	8	Pyridine	8.80E-01	mg/kg		7.82E+00	NoA
195	8	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	8	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	8	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	9	1,2,4-Trichlorobenzene	4.60E-01	mg/kg		7.86E-01	NoA
195	9	1,2-Dichlorobenzene	4.60E-01	mg/kg		2.92E+01	NoA
195	9	1,3-Dichlorobenzene	4.60E-01	mg/kg			NoC
195	9	1,4-Dichlorobenzene	4.60E-01	mg/kg		8.13E-01	NoA
195	9	2,4,5-Trichlorophenol	4.60E-01	mg/kg		3.26E+02	NoA
195	9	2,4,6-Trichlorophenol	4.60E-01	mg/kg		3.26E+00	NoA
195	9	2,4-Dichlorophenol	4.60E-01	mg/kg		9.78E+00	NoA
195	9	2,4-Dimethylphenol	4.60E-01	mg/kg		6.52E+01	NoA
195	9	2,4-Dinitrophenol	2.20E+00	mg/kg		6.52E+00	NoA
195	9	2,4-Dinitrotoluene	4.60E-01	mg/kg		5.63E-01	NoA
195	9	2,6-Dinitrotoluene	4.60E-01	mg/kg		3.26E+00	NoA
195	9	2-Chloronaphthalene	4.60E-01	mg/kg		6.26E+02	NoA
195	9	2-Chlorophenol	4.60E-01	mg/kg		3.91E+01	NoA
195	9	2-Methyl-4,6-dinitrophenol	2.20E+00	mg/kg		2.61E-01	Yes
195	9	2-Methylnaphthalene	4.60E-01	mg/kg		1.30E+01	NoA
195	9	2-Methylphenol	4.60E-01	mg/kg		1.54E+02	NoA
195	9	2-Nitrobenzenamine	2.20E+00	mg/kg		2.96E-01	Yes
195	9	2-Nitrophenol	4.60E-01	mg/kg			NoC
195	9	3,3'-Dichlorobenzidine	2.20E+00	mg/kg		3.85E-01	Yes
195	9	3-Nitrobenzenamine	2.20E+00	mg/kg		9.78E-01	Yes
195	9	4-Bromophenyl phenyl ether	4.60E-01	mg/kg			NoC
195	9	4-Chloro-3-methylphenol	4.60E-01	mg/kg			NoC
195	9	4-Chlorobenzenamine	4.60E-01	mg/kg		8.66E-01	NoA
195	9	4-Chlorophenyl phenyl ether	4.60E-01	mg/kg			NoC
195	9	4-Nitrophenol	2.20E+00	mg/kg			NoC
195	9	Acenaphthene	4.60E-01	mg/kg		1.17E+02	NoA
195	9	Acenaphthylene	4.60E-01	mg/kg			NoC
195	9	Anthracene	4.60E-01	mg/kg		7.47E+02	NoA
195	9	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	9	Benzenemethanol	4.60E-01	mg/kg		3.26E+02	NoA
195	9	Benzo(ghi)perylene	4.60E-01	mg/kg			NoC
195	9	Benzoic acid	2.20E+00	mg/kg		1.30E+04	NoA
195	9	Bis(2-chloroethoxy)methane	4.60E-01	mg/kg		9.78E+00	NoA
195	9	Bis(2-chloroethyl) ether	9.20E-03	mg/kg		2.14E-01	NoA
195	9	Bis(2-chloroisopropyl) ether	4.60E-01	mg/kg		4.57E+00	NoA
195	9	Butyl benzyl phthalate	4.60E-01	mg/kg		9.18E+01	NoA
195	9	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	9	Dibenzofuran	4.60E-01	mg/kg		3.26E+00	NoA
195	9	Diethyl phthalate	4.60E-01	mg/kg		2.61E+03	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	9	Dimethyl phthalate	4.60E-01	mg/kg			NoC
195	9	Di-n-butyl phthalate	4.60E-01	mg/kg		3.26E+02	NoA
195	9	Di-n-octylphthalate	4.60E-01	mg/kg		1.30E+02	NoA
195	9	Fluoranthene	4.60E-01	mg/kg		1.09E+02	NoA
195	9	Fluorene	4.60E-01	mg/kg		9.15E+01	NoA
195	9	Hexachlorobenzene	4.60E-01	mg/kg		4.92E-02	Yes
195	9	Hexachlorobutadiene	4.60E-01	mg/kg		2.22E+00	NoA
195	9	Hexachlorocyclopentadiene	2.20E+00	mg/kg		1.95E+01	NoA
195	9	Hexachloroethane	4.60E-01	mg/kg		2.28E+00	NoA
195	9	Isophorone	4.60E-01	mg/kg		1.82E+02	NoA
195	9	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	9	m,p-Cresol	9.20E-01	mg/kg		3.91E+01	NoA
195	9	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	9	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	9	Naphthalene	4.60E-01	mg/kg		1.15E+00	NoA
195	9	Nitrobenzene	2.20E+00	mg/kg		4.79E+00	NoA
195	9	N-Nitroso-di-n-propylamine	9.20E-03	mg/kg		1.89E-02	NoA
195	9	N-Nitrosodiphenylamine	4.60E-01	mg/kg		3.22E+01	NoA
195	9	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	9	Pentachlorophenol	2.20E+00	mg/kg		4.36E-01	Yes
195	9	Phenanthrene	4.60E-01	mg/kg			NoC
195	9	Phenol	4.60E-01	mg/kg		4.98E+02	NoA
195	9	p-Nitroaniline	2.20E+00	mg/kg		8.66E+00	NoA
195	9	Pyrene	4.60E-01	mg/kg		8.12E+01	NoA
195	9	Pyridine	9.20E-01	mg/kg		7.82E+00	NoA
195	9	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	9	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	9	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	10	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
195	10	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
195	10	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
195	10	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
195	10	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
195	10	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
195	10	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
195	10	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
195	10	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
195	10	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
195	10	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
195	10	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
195	10	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
195	10	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
195	10	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
195	10	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
195	10	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
195	10	2-Nitrophenol	4.20E-01	mg/kg			NoC
195	10	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
195	10	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
195	10	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	10	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
195	10	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
195	10	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	10	4-Nitrophenol	2.10E+00	mg/kg			NoC
195	10	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
195	10	Acenaphthylene	4.20E-01	mg/kg			NoC
195	10	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
195	10	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	10	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
195	10	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
195	10	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
195	10	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
195	10	Bis(2-chloroethyl) ether	8.50E-03	mg/kg		2.14E-01	NoA
195	10	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
195	10	Bis(2-ethylhexyl)phthalate	4.20E-01	mg/kg		1.25E+01	NoA
195	10	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
195	10	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	10	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
195	10	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
195	10	Dimethyl phthalate	4.20E-01	mg/kg			NoC
195	10	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
195	10	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
195	10	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
195	10	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
195	10	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
195	10	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
195	10	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
195	10	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
195	10	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
195	10	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	10	m,p-Cresol	8.50E-01	mg/kg		3.91E+01	NoA
195	10	Manganese	8.50E+01	mg/kg	1.50E+03	4.19E+02	NoAB
195	10	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	10	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	10	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
195	10	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
195	10	N-Nitroso-di-n-propylamine	8.50E-03	mg/kg		1.89E-02	NoA
195	10	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
195	10	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	10	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
195	10	Phenanthrene	4.20E-01	mg/kg			NoC
195	10	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
195	10	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
195	10	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
195	10	Pyridine	8.50E-01	mg/kg		7.82E+00	NoA
195	10	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	10	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	11	1,2,4-Trichlorobenzene	4.30E-01	mg/kg		7.86E-01	NoA
195	11	1,2-Dichlorobenzene	4.30E-01	mg/kg		2.92E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	11	1,3-Dichlorobenzene	4.30E-01	mg/kg			NoC
195	11	1,4-Dichlorobenzene	4.30E-01	mg/kg		8.13E-01	NoA
195	11	2,4,5-Trichlorophenol	4.30E-01	mg/kg		3.26E+02	NoA
195	11	2,4,6-Trichlorophenol	4.30E-01	mg/kg		3.26E+00	NoA
195	11	2,4-Dichlorophenol	4.30E-01	mg/kg		9.78E+00	NoA
195	11	2,4-Dimethylphenol	4.30E-01	mg/kg		6.52E+01	NoA
195	11	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
195	11	2,4-Dinitrotoluene	4.30E-01	mg/kg		5.63E-01	NoA
195	11	2,6-Dinitrotoluene	4.30E-01	mg/kg		3.26E+00	NoA
195	11	2-Chloronaphthalene	4.30E-01	mg/kg		6.26E+02	NoA
195	11	2-Chlorophenol	4.30E-01	mg/kg		3.91E+01	NoA
195	11	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
195	11	2-Methylnaphthalene	4.30E-01	mg/kg		1.30E+01	NoA
195	11	2-Methylphenol	4.30E-01	mg/kg		1.54E+02	NoA
195	11	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
195	11	2-Nitrophenol	4.30E-01	mg/kg			NoC
195	11	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
195	11	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
195	11	4-Bromophenyl phenyl ether	4.30E-01	mg/kg			NoC
195	11	4-Chloro-3-methylphenol	4.30E-01	mg/kg			NoC
195	11	4-Chlorobenzenamine	4.30E-01	mg/kg		8.66E-01	NoA
195	11	4-Chlorophenyl phenyl ether	4.30E-01	mg/kg			NoC
195	11	4-Nitrophenol	2.10E+00	mg/kg			NoC
195	11	Acenaphthene	4.30E-01	mg/kg		1.17E+02	NoA
195	11	Acenaphthylene	4.30E-01	mg/kg			NoC
195	11	Anthracene	4.30E-01	mg/kg		7.47E+02	NoA
195	11	Benzenemethanol	4.30E-01	mg/kg		3.26E+02	NoA
195	11	Benzo(ghi)perylene	4.30E-01	mg/kg			NoC
195	11	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
195	11	Bis(2-chloroethoxy)methane	4.30E-01	mg/kg		9.78E+00	NoA
195	11	Bis(2-chloroethyl) ether	8.50E-03	mg/kg		2.14E-01	NoA
195	11	Bis(2-chloroisopropyl) ether	4.30E-01	mg/kg		4.57E+00	NoA
195	11	Bis(2-ethylhexyl)phthalate	4.30E-01	mg/kg		1.25E+01	NoA
195	11	Butyl benzyl phthalate	4.30E-01	mg/kg		9.18E+01	NoA
195	11	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	11	Dibenzofuran	4.30E-01	mg/kg		3.26E+00	NoA
195	11	Diethyl phthalate	4.30E-01	mg/kg		2.61E+03	NoA
195	11	Dimethyl phthalate	4.30E-01	mg/kg			NoC
195	11	Di-n-butyl phthalate	4.30E-01	mg/kg		3.26E+02	NoA
195	11	Di-n-octylphthalate	4.30E-01	mg/kg		1.30E+02	NoA
195	11	Fluoranthene	4.30E-01	mg/kg		1.09E+02	NoA
195	11	Fluorene	4.30E-01	mg/kg		9.15E+01	NoA
195	11	Hexachlorobenzene	4.30E-01	mg/kg		4.92E-02	Yes
195	11	Hexachlorobutadiene	4.30E-01	mg/kg		2.22E+00	NoA
195	11	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
195	11	Hexachloroethane	4.30E-01	mg/kg		2.28E+00	NoA
195	11	Isophorone	4.30E-01	mg/kg		1.82E+02	NoA
195	11	m,p-Cresol	8.50E-01	mg/kg		3.91E+01	NoA
195	11	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	11	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	11	Naphthalene	4.30E-01	mg/kg		1.15E+00	NoA
195	11	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
195	11	N-Nitroso-di-n-propylamine	8.50E-03	mg/kg		1.89E-02	NoA
195	11	N-Nitrosodiphenylamine	4.30E-01	mg/kg		3.22E+01	NoA
195	11	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	11	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
195	11	Phenanthrene	4.30E-01	mg/kg			NoC
195	11	Phenol	4.30E-01	mg/kg		4.98E+02	NoA
195	11	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
195	11	Pyrene	4.30E-01	mg/kg		8.12E+01	NoA
195	11	Pyridine	8.50E-01	mg/kg		7.82E+00	NoA
195	11	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	11	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	11	Total PAH	8.50E-03	mg/kg		1.97E-02	NoA
195	11	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	12	1,2,4-Trichlorobenzene	4.30E-01	mg/kg		7.86E-01	NoA
195	12	1,2-Dichlorobenzene	4.30E-01	mg/kg		2.92E+01	NoA
195	12	1,3-Dichlorobenzene	4.30E-01	mg/kg			NoC
195	12	1,4-Dichlorobenzene	4.30E-01	mg/kg		8.13E-01	NoA
195	12	2,4,5-Trichlorophenol	4.30E-01	mg/kg		3.26E+02	NoA
195	12	2,4,6-Trichlorophenol	4.30E-01	mg/kg		3.26E+00	NoA
195	12	2,4-Dichlorophenol	4.30E-01	mg/kg		9.78E+00	NoA
195	12	2,4-Dimethylphenol	4.30E-01	mg/kg		6.52E+01	NoA
195	12	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
195	12	2,4-Dinitrotoluene	4.30E-01	mg/kg		5.63E-01	NoA
195	12	2,6-Dinitrotoluene	4.30E-01	mg/kg		3.26E+00	NoA
195	12	2-Chloronaphthalene	4.30E-01	mg/kg		6.26E+02	NoA
195	12	2-Chlorophenol	4.30E-01	mg/kg		3.91E+01	NoA
195	12	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
195	12	2-Methylnaphthalene	4.30E-01	mg/kg		1.30E+01	NoA
195	12	2-Methylphenol	4.30E-01	mg/kg		1.54E+02	NoA
195	12	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
195	12	2-Nitrophenol	4.30E-01	mg/kg			NoC
195	12	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
195	12	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
195	12	4-Bromophenyl phenyl ether	4.30E-01	mg/kg			NoC
195	12	4-Chloro-3-methylphenol	4.30E-01	mg/kg			NoC
195	12	4-Chlorobenzenamine	4.30E-01	mg/kg		8.66E-01	NoA
195	12	4-Chlorophenyl phenyl ether	4.30E-01	mg/kg			NoC
195	12	4-Nitrophenol	2.10E+00	mg/kg			NoC
195	12	Acenaphthene	4.30E-01	mg/kg		1.17E+02	NoA
195	12	Acenaphthylene	4.30E-01	mg/kg			NoC
195	12	Anthracene	4.30E-01	mg/kg		7.47E+02	NoA
195	12	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	12	Benzenemethanol	4.30E-01	mg/kg		3.26E+02	NoA
195	12	Benzo(ghi)perylene	4.30E-01	mg/kg			NoC
195	12	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
195	12	Bis(2-chloroethoxy)methane	4.30E-01	mg/kg		9.78E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	12	Bis(2-chloroethyl) ether	8.50E-03	mg/kg		2.14E-01	NoA
195	12	Bis(2-chloroisopropyl) ether	4.30E-01	mg/kg		4.57E+00	NoA
195	12	Bis(2-ethylhexyl)phthalate	4.30E-01	mg/kg		1.25E+01	NoA
195	12	Butyl benzyl phthalate	4.30E-01	mg/kg		9.18E+01	NoA
195	12	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	12	Dibenzofuran	4.30E-01	mg/kg		3.26E+00	NoA
195	12	Diethyl phthalate	4.30E-01	mg/kg		2.61E+03	NoA
195	12	Dimethyl phthalate	4.30E-01	mg/kg			NoC
195	12	Di-n-butyl phthalate	4.30E-01	mg/kg		3.26E+02	NoA
195	12	Di-n-octylphthalate	4.30E-01	mg/kg		1.30E+02	NoA
195	12	Fluoranthene	4.30E-01	mg/kg		1.09E+02	NoA
195	12	Fluorene	4.30E-01	mg/kg		9.15E+01	NoA
195	12	Hexachlorobenzene	4.30E-01	mg/kg		4.92E-02	Yes
195	12	Hexachlorobutadiene	4.30E-01	mg/kg		2.22E+00	NoA
195	12	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
195	12	Hexachloroethane	4.30E-01	mg/kg		2.28E+00	NoA
195	12	Isophorone	4.30E-01	mg/kg		1.82E+02	NoA
195	12	m,p-Cresol	8.50E-01	mg/kg		3.91E+01	NoA
195	12	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	12	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	12	Naphthalene	4.30E-01	mg/kg		1.15E+00	NoA
195	12	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
195	12	N-Nitroso-di-n-propylamine	8.50E-03	mg/kg		1.89E-02	NoA
195	12	N-Nitrosodiphenylamine	4.30E-01	mg/kg		3.22E+01	NoA
195	12	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	12	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
195	12	Phenanthrene	4.30E-01	mg/kg			NoC
195	12	Phenol	4.30E-01	mg/kg		4.98E+02	NoA
195	12	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
195	12	Pyrene	4.30E-01	mg/kg		8.12E+01	NoA
195	12	Pyridine	8.50E-01	mg/kg		7.82E+00	NoA
195	12	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	12	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	12	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	13	1,2,4-Trichlorobenzene	3.90E-01	mg/kg		7.86E-01	NoA
195	13	1,2-Dichlorobenzene	3.90E-01	mg/kg		2.92E+01	NoA
195	13	1,3-Dichlorobenzene	3.90E-01	mg/kg			NoC
195	13	1,4-Dichlorobenzene	3.90E-01	mg/kg		8.13E-01	NoA
195	13	2,4,5-Trichlorophenol	3.90E-01	mg/kg		3.26E+02	NoA
195	13	2,4,6-Trichlorophenol	3.90E-01	mg/kg		3.26E+00	NoA
195	13	2,4-Dichlorophenol	3.90E-01	mg/kg		9.78E+00	NoA
195	13	2,4-Dimethylphenol	3.90E-01	mg/kg		6.52E+01	NoA
195	13	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
195	13	2,4-Dinitrotoluene	3.90E-01	mg/kg		5.63E-01	NoA
195	13	2,6-Dinitrotoluene	3.90E-01	mg/kg		3.26E+00	NoA
195	13	2-Chloronaphthalene	3.90E-01	mg/kg		6.26E+02	NoA
195	13	2-Chlorophenol	3.90E-01	mg/kg		3.91E+01	NoA
195	13	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
195	13	2-Methylnaphthalene	3.90E-01	mg/kg		1.30E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	13	2-Methylphenol	3.90E-01	mg/kg		1.54E+02	NoA
195	13	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
195	13	2-Nitrophenol	3.90E-01	mg/kg			NoC
195	13	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
195	13	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
195	13	4-Bromophenyl phenyl ether	3.90E-01	mg/kg			NoC
195	13	4-Chloro-3-methylphenol	3.90E-01	mg/kg			NoC
195	13	4-Chlorobenzenamine	3.90E-01	mg/kg		8.66E-01	NoA
195	13	4-Chlorophenyl phenyl ether	3.90E-01	mg/kg			NoC
195	13	4-Nitrophenol	1.90E+00	mg/kg			NoC
195	13	Acenaphthene	3.90E-01	mg/kg		1.17E+02	NoA
195	13	Acenaphthylene	3.90E-01	mg/kg			NoC
195	13	Anthracene	3.90E-01	mg/kg		7.47E+02	NoA
195	13	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	13	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
195	13	Benzo(ghi)perylene	3.90E-01	mg/kg			NoC
195	13	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
195	13	Bis(2-chloroethoxy)methane	3.90E-01	mg/kg		9.78E+00	NoA
195	13	Bis(2-chloroethyl) ether	7.90E-03	mg/kg		2.14E-01	NoA
195	13	Bis(2-chloroisopropyl) ether	3.90E-01	mg/kg		4.57E+00	NoA
195	13	Butyl benzyl phthalate	3.90E-01	mg/kg		9.18E+01	NoA
195	13	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	13	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
195	13	Diethyl phthalate	3.90E-01	mg/kg		2.61E+03	NoA
195	13	Dimethyl phthalate	3.90E-01	mg/kg			NoC
195	13	Di-n-butyl phthalate	3.90E-01	mg/kg		3.26E+02	NoA
195	13	Di-n-octylphthalate	3.90E-01	mg/kg		1.30E+02	NoA
195	13	Fluoranthene	3.90E-01	mg/kg		1.09E+02	NoA
195	13	Fluorene	3.90E-01	mg/kg		9.15E+01	NoA
195	13	Hexachlorobenzene	3.90E-01	mg/kg		4.92E-02	Yes
195	13	Hexachlorobutadiene	3.90E-01	mg/kg		2.22E+00	NoA
195	13	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
195	13	Hexachloroethane	3.90E-01	mg/kg		2.28E+00	NoA
195	13	Isophorone	3.90E-01	mg/kg		1.82E+02	NoA
195	13	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	13	m,p-Cresol	7.90E-01	mg/kg		3.91E+01	NoA
195	13	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	13	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	13	Naphthalene	3.90E-01	mg/kg		1.15E+00	NoA
195	13	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
195	13	N-Nitroso-di-n-propylamine	7.90E-03	mg/kg		1.89E-02	NoA
195	13	N-Nitrosodiphenylamine	3.90E-01	mg/kg		3.22E+01	NoA
195	13	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	13	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
195	13	Phenanthrene	3.90E-01	mg/kg			NoC
195	13	Phenol	3.90E-01	mg/kg		4.98E+02	NoA
195	13	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
195	13	Pyrene	3.90E-01	mg/kg		8.12E+01	NoA
195	13	Pyridine	7.90E-01	mg/kg		7.82E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	13	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	13	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	13	Total PAH	7.90E-03	mg/kg		1.97E-02	NoA
195	13	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	14	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
195	14	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
195	14	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
195	14	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
195	14	2,4,5-Trichlorophenol	4.20E-01	mg/kg		3.26E+02	NoA
195	14	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
195	14	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
195	14	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
195	14	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
195	14	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
195	14	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
195	14	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
195	14	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
195	14	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
195	14	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
195	14	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
195	14	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
195	14	2-Nitrophenol	4.20E-01	mg/kg			NoC
195	14	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
195	14	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
195	14	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	14	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
195	14	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
195	14	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
195	14	4-Nitrophenol	2.00E+00	mg/kg			NoC
195	14	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
195	14	Acenaphthylene	4.20E-01	mg/kg			NoC
195	14	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
195	14	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	14	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
195	14	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
195	14	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
195	14	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
195	14	Bis(2-chloroethyl) ether	8.30E-03	mg/kg		2.14E-01	NoA
195	14	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
195	14	Bis(2-ethylhexyl)phthalate	4.20E-01	mg/kg		1.25E+01	NoA
195	14	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
195	14	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	14	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
195	14	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
195	14	Dimethyl phthalate	4.20E-01	mg/kg			NoC
195	14	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA
195	14	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
195	14	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
195	14	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	14	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
195	14	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
195	14	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
195	14	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
195	14	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
195	14	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	14	m,p-Cresol	8.30E-01	mg/kg		3.91E+01	NoA
195	14	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	14	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	14	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
195	14	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
195	14	N-Nitroso-di-n-propylamine	8.30E-03	mg/kg		1.89E-02	NoA
195	14	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
195	14	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	14	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
195	14	Phenanthrene	4.20E-01	mg/kg			NoC
195	14	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
195	14	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
195	14	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
195	14	Pyridine	8.30E-01	mg/kg		7.82E+00	NoA
195	14	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	14	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	14	Sodium	1.26E+02	mg/kg	3.20E+02		NoBE
195	14	Total PAH	8.30E-03	mg/kg		1.97E-02	NoA
195	14	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	15	1,2,4-Trichlorobenzene	4.50E-01	mg/kg		7.86E-01	NoA
195	15	1,2-Dichlorobenzene	4.50E-01	mg/kg		2.92E+01	NoA
195	15	1,3-Dichlorobenzene	4.50E-01	mg/kg			NoC
195	15	1,4-Dichlorobenzene	4.50E-01	mg/kg		8.13E-01	NoA
195	15	2,4,5-Trichlorophenol	4.50E-01	mg/kg		3.26E+02	NoA
195	15	2,4,6-Trichlorophenol	4.50E-01	mg/kg		3.26E+00	NoA
195	15	2,4-Dichlorophenol	4.50E-01	mg/kg		9.78E+00	NoA
195	15	2,4-Dimethylphenol	4.50E-01	mg/kg		6.52E+01	NoA
195	15	2,4-Dinitrophenol	2.20E+00	mg/kg		6.52E+00	NoA
195	15	2,4-Dinitrotoluene	4.50E-01	mg/kg		5.63E-01	NoA
195	15	2,6-Dinitrotoluene	4.50E-01	mg/kg		3.26E+00	NoA
195	15	2-Chloronaphthalene	4.50E-01	mg/kg		6.26E+02	NoA
195	15	2-Chlorophenol	4.50E-01	mg/kg		3.91E+01	NoA
195	15	2-Methyl-4,6-dinitrophenol	2.20E+00	mg/kg		2.61E-01	Yes
195	15	2-Methylnaphthalene	4.50E-01	mg/kg		1.30E+01	NoA
195	15	2-Methylphenol	4.50E-01	mg/kg		1.54E+02	NoA
195	15	2-Nitrobenzenamine	2.20E+00	mg/kg		2.96E-01	Yes
195	15	2-Nitrophenol	4.50E-01	mg/kg			NoC
195	15	3,3'-Dichlorobenzidine	2.20E+00	mg/kg		3.85E-01	Yes
195	15	3-Nitrobenzenamine	2.20E+00	mg/kg		9.78E-01	Yes
195	15	4-Bromophenyl phenyl ether	4.50E-01	mg/kg			NoC
195	15	4-Chloro-3-methylphenol	4.50E-01	mg/kg			NoC
195	15	4-Chlorobenzenamine	4.50E-01	mg/kg		8.66E-01	NoA
195	15	4-Chlorophenyl phenyl ether	4.50E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	15	4-Nitrophenol	2.20E+00	mg/kg			NoC
195	15	Acenaphthene	4.50E-01	mg/kg		1.17E+02	NoA
195	15	Acenaphthylene	4.50E-01	mg/kg			NoC
195	15	Anthracene	4.50E-01	mg/kg		7.47E+02	NoA
195	15	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	15	Benzenemethanol	4.50E-01	mg/kg		3.26E+02	NoA
195	15	Benzo(ghi)perylene	4.50E-01	mg/kg			NoC
195	15	Benzoic acid	2.20E+00	mg/kg		1.30E+04	NoA
195	15	Bis(2-chloroethoxy)methane	4.50E-01	mg/kg		9.78E+00	NoA
195	15	Bis(2-chloroethyl) ether	9.00E-03	mg/kg		2.14E-01	NoA
195	15	Bis(2-chloroisopropyl) ether	4.50E-01	mg/kg		4.57E+00	NoA
195	15	Bis(2-ethylhexyl)phthalate	4.50E-01	mg/kg		1.25E+01	NoA
195	15	Butyl benzyl phthalate	4.50E-01	mg/kg		9.18E+01	NoA
195	15	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	15	Dibenzofuran	4.50E-01	mg/kg		3.26E+00	NoA
195	15	Diethyl phthalate	4.50E-01	mg/kg		2.61E+03	NoA
195	15	Dimethyl phthalate	4.50E-01	mg/kg			NoC
195	15	Di-n-butyl phthalate	4.50E-01	mg/kg		3.26E+02	NoA
195	15	Di-n-octylphthalate	4.50E-01	mg/kg		1.30E+02	NoA
195	15	Fluoranthene	4.50E-01	mg/kg		1.09E+02	NoA
195	15	Fluorene	4.50E-01	mg/kg		9.15E+01	NoA
195	15	Hexachlorobenzene	4.50E-01	mg/kg		4.92E-02	Yes
195	15	Hexachlorobutadiene	4.50E-01	mg/kg		2.22E+00	NoA
195	15	Hexachlorocyclopentadiene	2.20E+00	mg/kg		1.95E+01	NoA
195	15	Hexachloroethane	4.50E-01	mg/kg		2.28E+00	NoA
195	15	Isophorone	4.50E-01	mg/kg		1.82E+02	NoA
195	15	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	15	m,p-Cresol	9.00E-01	mg/kg		3.91E+01	NoA
195	15	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	15	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	15	Naphthalene	4.50E-01	mg/kg		1.15E+00	NoA
195	15	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
195	15	Nitrobenzene	2.20E+00	mg/kg		4.79E+00	NoA
195	15	N-Nitroso-di-n-propylamine	9.00E-03	mg/kg		1.89E-02	NoA
195	15	N-Nitrosodiphenylamine	4.50E-01	mg/kg		3.22E+01	NoA
195	15	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	15	Pentachlorophenol	2.20E+00	mg/kg		4.36E-01	Yes
195	15	Phenanthrene	4.50E-01	mg/kg			NoC
195	15	Phenol	4.50E-01	mg/kg		4.98E+02	NoA
195	15	p-Nitroaniline	2.20E+00	mg/kg		8.66E+00	NoA
195	15	Pyrene	4.50E-01	mg/kg		8.12E+01	NoA
195	15	Pyridine	9.00E-01	mg/kg		7.82E+00	NoA
195	15	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	15	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	15	Thallium	2.70E-01	mg/kg	2.10E-01	3.68E-01	NoA
195	15	Total PAH	9.00E-03	mg/kg		1.97E-02	NoA
195	15	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	16	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
195	16	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	16	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
195	16	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
195	16	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
195	16	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
195	16	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
195	16	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
195	16	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
195	16	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
195	16	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA
195	16	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
195	16	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
195	16	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
195	16	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
195	16	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
195	16	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
195	16	2-Nitrophenol	4.00E-01	mg/kg			NoC
195	16	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
195	16	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
195	16	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
195	16	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
195	16	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
195	16	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC
195	16	4-Nitrophenol	1.90E+00	mg/kg			NoC
195	16	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
195	16	Acenaphthylene	4.00E-01	mg/kg			NoC
195	16	Anthracene	4.00E-01	mg/kg		7.47E+02	NoA
195	16	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	16	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
195	16	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
195	16	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
195	16	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA
195	16	Bis(2-chloroethyl) ether	7.90E-03	mg/kg		2.14E-01	NoA
195	16	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
195	16	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
195	16	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
195	16	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	16	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
195	16	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
195	16	Dimethyl phthalate	4.00E-01	mg/kg			NoC
195	16	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
195	16	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
195	16	Fluoranthene	4.00E-01	mg/kg		1.09E+02	NoA
195	16	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
195	16	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
195	16	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
195	16	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
195	16	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
195	16	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA
195	16	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	16	m,p-Cresol	7.90E-01	mg/kg		3.91E+01	NoA
195	16	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
195	16	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	16	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
195	16	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
195	16	N-Nitroso-di-n-propylamine	7.90E-03	mg/kg		1.89E-02	NoA
195	16	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
195	16	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
195	16	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
195	16	Phenanthrene	4.00E-01	mg/kg			NoC
195	16	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
195	16	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
195	16	Pyrene	4.00E-01	mg/kg		8.12E+01	NoA
195	16	Pyridine	7.90E-01	mg/kg		7.82E+00	NoA
195	16	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	16	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
195	16	Thallium	2.40E-01	mg/kg	2.10E-01	3.68E-01	NoA
195	16	Total PAH	7.90E-03	mg/kg		1.97E-02	NoA
195	16	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
195	17	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
195	17	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
195	17	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
195	17	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
195	17	2,4,5-Trichlorophenol	4.10E-01	mg/kg		3.26E+02	NoA
195	17	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
195	17	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
195	17	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
195	17	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
195	17	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
195	17	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA
195	17	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
195	17	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
195	17	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
195	17	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
195	17	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
195	17	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
195	17	2-Nitrophenol	4.10E-01	mg/kg			NoC
195	17	3,3'-Dichlorobenzidine	2.00E+00	mg/kg		3.85E-01	Yes
195	17	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
195	17	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
195	17	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
195	17	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
195	17	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
195	17	4-Nitrophenol	2.00E+00	mg/kg			NoC
195	17	Acenaphthene	4.10E-01	mg/kg		1.17E+02	NoA
195	17	Acenaphthylene	4.10E-01	mg/kg			NoC
195	17	Anthracene	4.10E-01	mg/kg		7.47E+02	NoA
195	17	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
195	17	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
195	17	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
195	17	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
195	17	Bis(2-chloroethyl) ether	8.20E-03	mg/kg		2.14E-01	NoA
195	17	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
195	17	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
195	17	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
195	17	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
195	17	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
195	17	Dimethyl phthalate	4.10E-01	mg/kg			NoC
195	17	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
195	17	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
195	17	Fluorene	4.10E-01	mg/kg		9.15E+01	NoA
195	17	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
195	17	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
195	17	Hexachlorocyclopentadiene	2.00E+00	mg/kg		1.95E+01	NoA
195	17	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
195	17	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
195	17	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
195	17	m,p-Cresol	8.20E-01	mg/kg		3.91E+01	NoA
195	17	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
195	17	Naphthalene	4.10E-01	mg/kg		1.15E+00	NoA
195	17	Nitrobenzene	2.00E+00	mg/kg		4.79E+00	NoA
195	17	N-Nitroso-di-n-propylamine	8.20E-03	mg/kg		1.89E-02	NoA
195	17	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
195	17	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
195	17	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
195	17	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
195	17	Pyridine	8.20E-01	mg/kg		7.82E+00	NoA
195	17	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
195	17	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
492	1	1,1,1-Trichloroethane	6.00E-03	mg/kg		1.46E+02	NoA
492	1	1,1,2,2-Tetrachloroethane	6.00E-03	mg/kg		5.62E-01	NoA
492	1	1,1,2-Trichloroethane	6.00E-03	mg/kg		2.30E-02	NoA
492	1	1,1-Dichloroethane	6.00E-03	mg/kg		1.34E+00	NoA
492	1	1,1-Dichloroethene	6.00E-03	mg/kg		2.37E-02	NoA
492	1	1,2,4-Trichlorobenzene	4.10E-01	mg/kg		7.86E-01	NoA
492	1	1,2-Dichlorobenzene	4.10E-01	mg/kg		2.92E+01	NoA
492	1	1,2-Dichloroethane	6.00E-03	mg/kg		1.55E-01	NoA
492	1	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
492	1	1,2-Dichloropropane	6.00E-03	mg/kg		9.40E-01	NoA
492	1	1,3-Dichlorobenzene	4.10E-01	mg/kg			NoC
492	1	1,4-Dichlorobenzene	4.10E-01	mg/kg		8.13E-01	NoA
492	1	2,4,5-Trichlorophenol	2.00E+00	mg/kg		3.26E+02	NoA
492	1	2,4,6-Trichlorophenol	4.10E-01	mg/kg		3.26E+00	NoA
492	1	2,4-Dichlorophenol	4.10E-01	mg/kg		9.78E+00	NoA
492	1	2,4-Dimethylphenol	4.10E-01	mg/kg		6.52E+01	NoA
492	1	2,4-Dinitrophenol	2.00E+00	mg/kg		6.52E+00	NoA
492	1	2,4-Dinitrotoluene	4.10E-01	mg/kg		5.63E-01	NoA
492	1	2,6-Dinitrotoluene	4.10E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
492	1	2-Butanone	1.20E-02	mg/kg		5.78E+02	NoA
492	1	2-Chloronaphthalene	4.10E-01	mg/kg		6.26E+02	NoA
492	1	2-Chlorophenol	4.10E-01	mg/kg		3.91E+01	NoA
492	1	2-Hexanone	1.20E-02	mg/kg		4.05E+00	NoA
492	1	2-Methyl-4,6-dinitrophenol	2.00E+00	mg/kg		2.61E-01	Yes
492	1	2-Methylnaphthalene	4.10E-01	mg/kg		1.30E+01	NoA
492	1	2-Methylphenol	4.10E-01	mg/kg		1.54E+02	NoA
492	1	2-Nitrobenzenamine	2.00E+00	mg/kg		2.96E-01	Yes
492	1	2-Nitrophenol	4.10E-01	mg/kg			NoC
492	1	3,3'-Dichlorobenzidine	8.20E-01	mg/kg		3.85E-01	Yes
492	1	3-Nitrobenzenamine	2.00E+00	mg/kg		9.78E-01	Yes
492	1	4-Bromophenyl phenyl ether	4.10E-01	mg/kg			NoC
492	1	4-Chloro-3-methylphenol	4.10E-01	mg/kg			NoC
492	1	4-Chlorobenzenamine	4.10E-01	mg/kg		8.66E-01	NoA
492	1	4-Chlorophenyl phenyl ether	4.10E-01	mg/kg			NoC
492	1	4-Methyl-2-pentanone	1.20E-02	mg/kg		1.13E+02	NoA
492	1	4-Nitrophenol	2.00E+00	mg/kg			NoC
492	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
492	1	Acenaphthylene	5.00E-01	mg/kg			NoC
492	1	Acetone	3.20E-02	mg/kg		1.34E+03	NoA
492	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
492	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
492	1	Benzene	6.00E-03	mg/kg		3.33E-01	NoA
492	1	Benzenemethanol	4.10E-01	mg/kg		3.26E+02	NoA
492	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
492	1	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
492	1	Bis(2-chloroethoxy)methane	4.10E-01	mg/kg		9.78E+00	NoA
492	1	Bis(2-chloroethyl) ether	4.10E-01	mg/kg		2.14E-01	Yes
492	1	Bis(2-chloroisopropyl) ether	4.10E-01	mg/kg		4.57E+00	NoA
492	1	Bis(2-ethylhexyl)phthalate	4.10E-01	mg/kg		1.25E+01	NoA
492	1	Bromodichloromethane	6.00E-03	mg/kg		2.73E-01	NoA
492	1	Bromoform	6.00E-03	mg/kg		2.19E+01	NoA
492	1	Bromomethane	1.20E-02	mg/kg		1.34E-01	NoA
492	1	Butyl benzyl phthalate	4.10E-01	mg/kg		9.18E+01	NoA
492	1	Carbon disulfide	6.00E-03	mg/kg		1.48E+01	NoA
492	1	Carbon tetrachloride	6.00E-03	mg/kg		2.39E-01	NoA
492	1	Chlorobenzene	6.00E-03	mg/kg		4.07E+00	NoA
492	1	Chloroethane	1.20E-02	mg/kg		1.45E+03	NoA
492	1	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
492	1	Chloromethane	1.20E-02	mg/kg		1.65E+00	NoA
492	1	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
492	1	Dibenzofuran	4.10E-01	mg/kg		3.26E+00	NoA
492	1	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA
492	1	Diethyl phthalate	4.10E-01	mg/kg		2.61E+03	NoA
492	1	Dimethyl phthalate	4.10E-01	mg/kg			NoC
492	1	Di-n-butyl phthalate	4.10E-01	mg/kg		3.26E+02	NoA
492	1	Di-n-octylphthalate	4.10E-01	mg/kg		1.30E+02	NoA
492	1	Ethylbenzene	6.00E-03	mg/kg		1.58E+00	NoA
492	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
492	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
492	1	Hexachlorobenzene	4.10E-01	mg/kg		4.92E-02	Yes
492	1	Hexachlorobutadiene	4.10E-01	mg/kg		2.22E+00	NoA
492	1	Hexachlorocyclopentadiene	4.10E-01	mg/kg		1.95E+01	NoA
492	1	Hexachloroethane	4.10E-01	mg/kg		2.28E+00	NoA
492	1	Isophorone	4.10E-01	mg/kg		1.82E+02	NoA
492	1	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
492	1	Mercury	2.00E-01	mg/kg	2.00E-01	2.13E-01	NoA
492	1	Methylene chloride	6.00E-03	mg/kg		3.65E+00	NoA
492	1	Molybdenum	4.68E+00	mg/kg		2.30E+01	NoA
492	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
492	1	Nitrobenzene	4.10E-01	mg/kg		4.79E+00	NoA
492	1	N-Nitroso-di-n-propylamine	4.10E-01	mg/kg		1.89E-02	Yes
492	1	N-Nitrosodiphenylamine	4.10E-01	mg/kg		3.22E+01	NoA
492	1	Pentachlorophenol	2.00E+00	mg/kg		4.36E-01	Yes
492	1	Phenanthrene	5.00E-01	mg/kg			NoC
492	1	Phenol	4.10E-01	mg/kg		4.98E+02	NoA
492	1	p-Nitroaniline	2.00E+00	mg/kg		8.66E+00	NoA
492	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
492	1	Selenium	9.37E-01	mg/kg	8.00E-01	2.30E+01	NoA
492	1	Silver	4.00E+00	mg/kg	2.30E+00	2.61E+00	Yes
492	1	Sodium	2.00E+02	mg/kg	3.20E+02		NoBE
492	1	Styrene	6.00E-03	mg/kg		9.43E+01	NoA
492	1	Tetrachloroethene	6.00E-03	mg/kg		1.13E-01	NoA
492	1	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
492	1	Toluene	6.00E-03	mg/kg		9.61E+01	NoA
492	1	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
492	1	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
492	1	trans-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
492	1	Trichloroethene	6.00E-03	mg/kg		2.34E-02	NoA
492	1	Vinyl acetate	1.20E-02	mg/kg		1.83E+01	NoA
492	1	Vinyl chloride	1.20E-02	mg/kg		8.24E-02	NoA
493	1	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
493	1	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
493	1	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
493	1	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
493	1	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
493	1	1,2,4-Trichlorobenzene	5.00E-01	mg/kg		7.86E-01	NoA
493	1	1,2-Dichlorobenzene	5.00E-01	mg/kg		2.92E+01	NoA
493	1	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
493	1	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
493	1	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
493	1	1,3-Dichlorobenzene	5.00E-01	mg/kg			NoC
493	1	1,4-Dichlorobenzene	5.00E-01	mg/kg		8.13E-01	NoA
493	1	2,4,5-Trichlorophenol	5.00E-01	mg/kg		3.26E+02	NoA
493	1	2,4,6-Trichlorophenol	5.00E-01	mg/kg		3.26E+00	NoA
493	1	2,4-Dichlorophenol	5.00E-01	mg/kg		9.78E+00	NoA
493	1	2,4-Dimethylphenol	5.00E-01	mg/kg		6.52E+01	NoA
493	1	2,4-Dinitrophenol	5.00E-01	mg/kg		6.52E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
493	1	2,4-Dinitrotoluene	5.00E-01	mg/kg		5.63E-01	NoA
493	1	2,6-Dinitrotoluene	5.00E-01	mg/kg		3.26E+00	NoA
493	1	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
493	1	2-Chloronaphthalene	5.00E-01	mg/kg		6.26E+02	NoA
493	1	2-Chlorophenol	5.00E-01	mg/kg		3.91E+01	NoA
493	1	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
493	1	2-Methyl-4,6-dinitrophenol	5.00E-01	mg/kg		2.61E-01	Yes
493	1	2-Methylnaphthalene	5.00E-01	mg/kg		1.30E+01	NoA
493	1	2-Methylphenol	5.00E-01	mg/kg		1.54E+02	NoA
493	1	2-Nitrobenzenamine	5.00E-01	mg/kg		2.96E-01	Yes
493	1	2-Nitrophenol	5.00E-01	mg/kg			NoC
493	1	3,3'-Dichlorobenzidine	5.00E-01	mg/kg		3.85E-01	Yes
493	1	3-Nitrobenzenamine	5.00E-01	mg/kg		9.78E-01	NoA
493	1	4-Bromophenyl phenyl ether	5.00E-01	mg/kg			NoC
493	1	4-Chloro-3-methylphenol	5.00E-01	mg/kg			NoC
493	1	4-Chlorobenzenamine	5.00E-01	mg/kg		8.66E-01	NoA
493	1	4-Chlorophenyl phenyl ether	5.00E-01	mg/kg			NoC
493	1	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
493	1	4-Nitrophenol	5.00E-01	mg/kg			NoC
493	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
493	1	Acenaphthylene	5.00E-01	mg/kg			NoC
493	1	Acetone	1.00E-02	mg/kg		1.34E+03	NoA
493	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
493	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
493	1	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
493	1	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
493	1	Benzenemethanol	5.00E-01	mg/kg		3.26E+02	NoA
493	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
493	1	Benzoic acid	5.00E-01	mg/kg		1.30E+04	NoA
493	1	Bis(2-chloroethoxy)methane	5.00E-01	mg/kg		9.78E+00	NoA
493	1	Bis(2-chloroethyl) ether	5.00E-01	mg/kg		2.14E-01	Yes
493	1	Bis(2-chloroisopropyl) ether	5.00E-01	mg/kg		4.57E+00	NoA
493	1	Bis(2-ethylhexyl)phthalate	5.00E-01	mg/kg		1.25E+01	NoA
493	1	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
493	1	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
493	1	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
493	1	Butyl benzyl phthalate	5.00E-01	mg/kg		9.18E+01	NoA
493	1	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
493	1	Carbazole	5.00E-01	mg/kg		8.72E+00	NoA
493	1	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
493	1	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
493	1	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
493	1	cis-1,2-Dichloroethene	1.00E-02	mg/kg		1.05E+00	NoA
493	1	cis-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
493	1	Dibenzofuran	5.00E-01	mg/kg		3.26E+00	NoA
493	1	Diethyl phthalate	5.00E-01	mg/kg		2.61E+03	NoA
493	1	Dimethyl phthalate	5.00E-01	mg/kg			NoC
493	1	Di-n-butyl phthalate	5.00E-01	mg/kg		3.26E+02	NoA
493	1	Di-n-octylphthalate	5.00E-01	mg/kg		1.30E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
493	1	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
493	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
493	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
493	1	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
493	1	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
493	1	Hexachlorocyclopentadiene	5.00E-01	mg/kg		1.95E+01	NoA
493	1	Hexachloroethane	5.00E-01	mg/kg		2.28E+00	NoA
493	1	Isophorone	5.00E-01	mg/kg		1.82E+02	NoA
493	1	Lead	2.00E+02	mg/kg	3.60E+01	4.00E+02	NoA
493	1	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
493	1	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
493	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
493	1	Nitrobenzene	5.00E-01	mg/kg		4.79E+00	NoA
493	1	N-Nitroso-di-n-propylamine	5.00E-01	mg/kg		1.89E-02	Yes
493	1	N-Nitrosodiphenylamine	5.00E-01	mg/kg		3.22E+01	NoA
493	1	Pentachlorophenol	5.00E-01	mg/kg		4.36E-01	Yes
493	1	Phenanthrene	5.00E-01	mg/kg			NoC
493	1	Phenol	5.00E-01	mg/kg		4.98E+02	NoA
493	1	p-Nitroaniline	5.00E-01	mg/kg		8.66E+00	NoA
493	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
493	1	Pyridine	5.00E-01	mg/kg		7.82E+00	NoA
493	1	Selenium	1.00E+00	mg/kg	8.00E-01	2.30E+01	NoA
493	1	Silver	4.00E+00	mg/kg	2.30E+00	2.61E+00	Yes
493	1	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
493	1	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
493	1	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
493	1	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
493	1	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
493	1	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
493	1	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
493	1	Uranium	2.00E+03	mg/kg	4.90E+00	1.38E+01	Yes
493	1	Vinyl chloride	1.00E-02	mg/kg		8.24E-02	NoA
493	1	Zinc	2.00E+02	mg/kg	6.50E+01	1.38E+03	NoA
517	1	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
517	1	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
517	1	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
517	1	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
517	1	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
517	1	1,2,4-Trichlorobenzene	4.90E-01	mg/kg		7.86E-01	NoA
517	1	1,2-Dichlorobenzene	4.90E-01	mg/kg		2.92E+01	NoA
517	1	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
517	1	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
517	1	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
517	1	1,3-Dichlorobenzene	4.90E-01	mg/kg			NoC
517	1	1,4-Dichlorobenzene	4.90E-01	mg/kg		8.13E-01	NoA
517	1	2,4,5-Trichlorophenol	4.90E-01	mg/kg		3.26E+02	NoA
517	1	2,4,6-Trichlorophenol	4.90E-01	mg/kg		3.26E+00	NoA
517	1	2,4-Dichlorophenol	4.90E-01	mg/kg		9.78E+00	NoA
517	1	2,4-Dimethylphenol	4.90E-01	mg/kg		6.52E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
517	1	2,4-Dinitrophenol	4.90E-01	mg/kg		6.52E+00	NoA
517	1	2,4-Dinitrotoluene	4.90E-01	mg/kg		5.63E-01	NoA
517	1	2,6-Dinitrotoluene	4.90E-01	mg/kg		3.26E+00	NoA
517	1	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
517	1	2-Chloronaphthalene	4.90E-01	mg/kg		6.26E+02	NoA
517	1	2-Chlorophenol	4.90E-01	mg/kg		3.91E+01	NoA
517	1	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
517	1	2-Methyl-4,6-dinitrophenol	4.90E-01	mg/kg		2.61E-01	Yes
517	1	2-Methylnaphthalene	4.90E-01	mg/kg		1.30E+01	NoA
517	1	2-Methylphenol	4.90E-01	mg/kg		1.54E+02	NoA
517	1	2-Nitrobenzenamine	4.90E-01	mg/kg		2.96E-01	Yes
517	1	2-Nitrophenol	4.90E-01	mg/kg			NoC
517	1	3,3'-Dichlorobenzidine	4.90E-01	mg/kg		3.85E-01	Yes
517	1	3-Nitrobenzenamine	4.90E-01	mg/kg		9.78E-01	NoA
517	1	4-Bromophenyl phenyl ether	4.90E-01	mg/kg			NoC
517	1	4-Chloro-3-methylphenol	4.90E-01	mg/kg			NoC
517	1	4-Chlorobenzenamine	4.90E-01	mg/kg		8.66E-01	NoA
517	1	4-Chlorophenyl phenyl ether	4.90E-01	mg/kg			NoC
517	1	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
517	1	4-Nitrophenol	4.90E-01	mg/kg			NoC
517	1	Acenaphthene	4.90E-01	mg/kg		1.17E+02	NoA
517	1	Acenaphthylene	4.90E-01	mg/kg			NoC
517	1	Acetone	1.00E-02	mg/kg		1.34E+03	NoA
517	1	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
517	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
517	1	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
517	1	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
517	1	Benzenemethanol	4.90E-01	mg/kg		3.26E+02	NoA
517	1	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
517	1	Benzoic acid	4.90E-01	mg/kg		1.30E+04	NoA
517	1	Bis(2-chloroethoxy)methane	4.90E-01	mg/kg		9.78E+00	NoA
517	1	Bis(2-chloroethyl) ether	4.90E-01	mg/kg		2.14E-01	Yes
517	1	Bis(2-chloroisopropyl) ether	4.90E-01	mg/kg		4.57E+00	NoA
517	1	Bis(2-ethylhexyl)phthalate	4.90E-01	mg/kg		1.25E+01	NoA
517	1	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
517	1	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
517	1	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
517	1	Butyl benzyl phthalate	4.90E-01	mg/kg		9.18E+01	NoA
517	1	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
517	1	Carbazole	4.90E-01	mg/kg		8.72E+00	NoA
517	1	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
517	1	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
517	1	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
517	1	cis-1,2-Dichloroethene	1.00E-02	mg/kg		1.05E+00	NoA
517	1	cis-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
517	1	Dibenzofuran	4.90E-01	mg/kg		3.26E+00	NoA
517	1	Diethyl phthalate	4.90E-01	mg/kg		2.61E+03	NoA
517	1	Dimethyl phthalate	4.90E-01	mg/kg			NoC
517	1	Di-n-butyl phthalate	4.80E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
517	1	Di-n-octylphthalate	4.90E-01	mg/kg		1.30E+02	NoA
517	1	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
517	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
517	1	Fluorene	4.90E-01	mg/kg		9.15E+01	NoA
517	1	Hexachlorobenzene	4.90E-01	mg/kg		4.92E-02	Yes
517	1	Hexachlorobutadiene	4.90E-01	mg/kg		2.22E+00	NoA
517	1	Hexachlorocyclopentadiene	4.90E-01	mg/kg		1.95E+01	NoA
517	1	Hexachloroethane	4.90E-01	mg/kg		2.28E+00	NoA
517	1	Isophorone	4.90E-01	mg/kg		1.82E+02	NoA
517	1	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
517	1	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
517	1	Mercury	2.00E-01	mg/kg	2.00E-01	2.13E-01	NoA
517	1	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
517	1	Naphthalene	4.90E-01	mg/kg		1.15E+00	NoA
517	1	Nitrobenzene	4.90E-01	mg/kg		4.79E+00	NoA
517	1	N-Nitroso-di-n-propylamine	4.90E-01	mg/kg		1.89E-02	Yes
517	1	N-Nitrosodiphenylamine	4.90E-01	mg/kg		3.22E+01	NoA
517	1	Pentachlorophenol	4.90E-01	mg/kg		4.36E-01	Yes
517	1	Phenanthrene	4.90E-01	mg/kg			NoC
517	1	Phenol	4.90E-01	mg/kg		4.98E+02	NoA
517	1	p-Nitroaniline	4.90E-01	mg/kg		8.66E+00	NoA
517	1	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
517	1	Pyridine	4.90E-01	mg/kg		7.82E+00	NoA
517	1	Selenium	1.00E+00	mg/kg	8.00E-01	2.30E+01	NoA
517	1	Silver	2.50E+00	mg/kg	2.30E+00	2.61E+00	NoA
517	1	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
517	1	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
517	1	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
517	1	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
517	1	Total PAH	4.90E-01	mg/kg		1.97E-02	Yes
517	1	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
517	1	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
517	1	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
517	1	Uranium	1.00E+02	mg/kg	4.90E+00	1.38E+01	Yes
517	1	Vinyl chloride	1.00E-02	mg/kg		8.24E-02	NoA
541	1	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
541	1	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
541	1	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
541	1	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
541	1	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
541	1	1,2,4-Trichlorobenzene	5.00E-01	mg/kg		7.86E-01	NoA
541	1	1,2-Dichlorobenzene	5.00E-01	mg/kg		2.92E+01	NoA
541	1	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
541	1	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
541	1	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
541	1	1,3-Dichlorobenzene	5.00E-01	mg/kg			NoC
541	1	1,4-Dichlorobenzene	5.00E-01	mg/kg		8.13E-01	NoA
541	1	2,4,5-Trichlorophenol	5.00E-01	mg/kg		3.26E+02	NoA
541	1	2,4,6-Trichlorophenol	5.00E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
541	1	2,4-Dichlorophenol	5.00E-01	mg/kg		9.78E+00	NoA
541	1	2,4-Dimethylphenol	5.00E-01	mg/kg		6.52E+01	NoA
541	1	2,4-Dinitrophenol	5.00E-01	mg/kg		6.52E+00	NoA
541	1	2,4-Dinitrotoluene	5.00E-01	mg/kg		5.63E-01	NoA
541	1	2,6-Dinitrotoluene	5.00E-01	mg/kg		3.26E+00	NoA
541	1	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
541	1	2-Chloronaphthalene	5.00E-01	mg/kg		6.26E+02	NoA
541	1	2-Chlorophenol	5.00E-01	mg/kg		3.91E+01	NoA
541	1	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
541	1	2-Methyl-4,6-dinitrophenol	5.00E-01	mg/kg		2.61E-01	Yes
541	1	2-Methylnaphthalene	5.00E-01	mg/kg		1.30E+01	NoA
541	1	2-Methylphenol	5.00E-01	mg/kg		1.54E+02	NoA
541	1	2-Nitrobenzenamine	5.00E-01	mg/kg		2.96E-01	Yes
541	1	2-Nitrophenol	5.00E-01	mg/kg			NoC
541	1	3,3'-Dichlorobenzidine	5.00E-01	mg/kg		3.85E-01	Yes
541	1	3-Nitrobenzenamine	5.00E-01	mg/kg		9.78E-01	NoA
541	1	4-Bromophenyl phenyl ether	5.00E-01	mg/kg			NoC
541	1	4-Chloro-3-methylphenol	5.00E-01	mg/kg			NoC
541	1	4-Chlorobenzenamine	5.00E-01	mg/kg		8.66E-01	NoA
541	1	4-Chlorophenyl phenyl ether	5.00E-01	mg/kg			NoC
541	1	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
541	1	4-Nitrophenol	5.00E-01	mg/kg			NoC
541	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
541	1	Acenaphthylene	5.00E-01	mg/kg			NoC
541	1	Acetone	1.00E-02	mg/kg		1.34E+03	NoA
541	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
541	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
541	1	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
541	1	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
541	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
541	1	Bis(2-chloroethoxy)methane	5.00E-01	mg/kg		9.78E+00	NoA
541	1	Bis(2-chloroethyl) ether	5.00E-01	mg/kg		2.14E-01	Yes
541	1	Bis(2-chloroisopropyl) ether	5.00E-01	mg/kg		4.57E+00	NoA
541	1	Bis(2-ethylhexyl)phthalate	5.00E-01	mg/kg		1.25E+01	NoA
541	1	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
541	1	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
541	1	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
541	1	Butyl benzyl phthalate	5.00E-01	mg/kg		9.18E+01	NoA
541	1	Carbazole	5.00E-01	mg/kg		8.72E+00	NoA
541	1	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
541	1	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
541	1	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
541	1	Chloroethane	1.00E-02	mg/kg		1.45E+03	NoA
541	1	Chloroform	1.00E-02	mg/kg		1.22E-01	NoA
541	1	Chloromethane	1.00E-02	mg/kg		1.65E+00	NoA
541	1	cis-1,2-Dichloroethene	1.00E-02	mg/kg		1.05E+00	NoA
541	1	cis-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
541	1	Copper	1.20E+01	mg/kg	1.90E+01	1.84E+02	NoAB
541	1	Dibenzofuran	5.00E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
541	1	Dibromochloromethane	1.00E-02	mg/kg		2.42E-01	NoA
541	1	Diethyl phthalate	5.00E-01	mg/kg		2.61E+03	NoA
541	1	Dimethyl phthalate	5.00E-01	mg/kg			NoC
541	1	Di-n-butyl phthalate	4.90E-01	mg/kg		3.26E+02	NoA
541	1	Di-n-octylphthalate	5.00E-01	mg/kg		1.30E+02	NoA
541	1	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
541	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
541	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
541	1	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
541	1	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
541	1	Hexachlorocyclopentadiene	5.00E-01	mg/kg		1.95E+01	NoA
541	1	Hexachloroethane	5.00E-01	mg/kg		2.28E+00	NoA
541	1	Isophorone	5.00E-01	mg/kg		1.82E+02	NoA
541	1	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
541	1	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
541	1	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
541	1	Molybdenum	5.00E+00	mg/kg		2.30E+01	NoA
541	1	Nitrobenzene	5.00E-01	mg/kg		4.79E+00	NoA
541	1	N-Nitroso-di-n-propylamine	5.00E-01	mg/kg		1.89E-02	Yes
541	1	N-Nitrosodiphenylamine	5.00E-01	mg/kg		3.22E+01	NoA
541	1	Pentachlorophenol	5.00E-01	mg/kg		4.36E-01	Yes
541	1	Phenanthrene	5.00E-01	mg/kg			NoC
541	1	Phenol	5.00E-01	mg/kg		4.98E+02	NoA
541	1	p-Nitroaniline	5.00E-01	mg/kg		8.66E+00	NoA
541	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
541	1	Pyridine	5.00E-01	mg/kg		7.82E+00	NoA
541	1	Selenium	4.97E+00	mg/kg	8.00E-01	2.30E+01	NoA
541	1	Silver	2.50E+00	mg/kg	2.30E+00	2.61E+00	NoA
541	1	Sodium	2.50E+02	mg/kg	3.20E+02		NoBE
541	1	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
541	1	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
541	1	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
541	1	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
541	1	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
541	1	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
541	1	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
541	1	Vinyl chloride	1.00E-02	mg/kg		8.24E-02	NoA
541	1	Zinc	1.94E+01	mg/kg	6.50E+01	1.38E+03	NoAB
561	1	1,1,1-Trichloroethane	5.00E-03	mg/kg		1.46E+02	NoA
561	1	1,1,2-Trichloroethane	5.00E-03	mg/kg		2.30E-02	NoA
561	1	1,1-Dichloroethane	5.00E-03	mg/kg		1.34E+00	NoA
561	1	1,1-Dichloroethene	5.00E-03	mg/kg		2.37E-02	NoA
561	1	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
561	1	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
561	1	1,2-Dichloroethane	5.00E-03	mg/kg		1.55E-01	NoA
561	1	1,2-Dimethylbenzene	5.00E-03	mg/kg		5.35E+01	NoA
561	1	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
561	1	1,4-Dichlorobenzene	5.00E-01	mg/kg		8.13E-01	NoA
561	1	2,4,5-Trichlorophenol	5.00E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
561	1	2,4,6-Trichlorophenol	5.00E-01	mg/kg		3.26E+00	NoA
561	1	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
561	1	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
561	1	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA
561	1	2,4-Dinitrotoluene	5.00E-01	mg/kg		5.63E-01	NoA
561	1	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
561	1	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA
561	1	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
561	1	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
561	1	2-Methylnaphthalene	4.40E-01	mg/kg		1.30E+01	NoA
561	1	2-Methylphenol	5.00E-01	mg/kg		1.54E+02	NoA
561	1	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
561	1	2-Nitrophenol	4.40E-01	mg/kg			NoC
561	1	3,3'-Dichlorobenzidine	2.10E+00	mg/kg		3.85E-01	Yes
561	1	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
561	1	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
561	1	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
561	1	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
561	1	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
561	1	4-Nitrophenol	2.10E+00	mg/kg			NoC
561	1	Acenaphthene	4.40E-01	mg/kg		1.17E+02	NoA
561	1	Acenaphthylene	4.40E-01	mg/kg			NoC
561	1	Anthracene	4.40E-01	mg/kg		7.47E+02	NoA
561	1	Benzene	5.00E-03	mg/kg		3.33E-01	NoA
561	1	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
561	1	Benzo(ghi)perylene	4.40E-01	mg/kg			NoC
561	1	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
561	1	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
561	1	Bis(2-chloroethyl) ether	4.40E-01	mg/kg		2.14E-01	Yes
561	1	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA
561	1	Bis(2-ethylhexyl)phthalate	4.40E-01	mg/kg		1.25E+01	NoA
561	1	Bromodichloromethane	5.00E-03	mg/kg		2.73E-01	NoA
561	1	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
561	1	Cadmium	1.83E+00	mg/kg	2.10E-01	8.11E-01	Yes
561	1	Carbon tetrachloride	5.00E-03	mg/kg		2.39E-01	NoA
561	1	Chloroform	5.00E-03	mg/kg		1.22E-01	NoA
561	1	cis-1,2-Dichloroethene	5.00E-03	mg/kg		1.05E+00	NoA
561	1	Dibenzofuran	4.40E-01	mg/kg		3.26E+00	NoA
561	1	Diethyl phthalate	4.40E-01	mg/kg		2.61E+03	NoA
561	1	Dimethyl phthalate	4.40E-01	mg/kg			NoC
561	1	Di-n-butyl phthalate	4.40E-01	mg/kg		3.26E+02	NoA
561	1	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA
561	1	Ethylbenzene	5.00E-03	mg/kg		1.58E+00	NoA
561	1	Fluoranthene	4.40E-01	mg/kg		1.09E+02	NoA
561	1	Fluorene	4.40E-01	mg/kg		9.15E+01	NoA
561	1	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
561	1	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
561	1	Hexachlorocyclopentadiene	2.10E+00	mg/kg		1.95E+01	NoA
561	1	Hexachloroethane	5.00E-01	mg/kg		2.28E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
561	1	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
561	1	Lead	1.83E+01	mg/kg	3.60E+01	4.00E+02	NoAB
561	1	m,p-Cresol	8.80E-01	mg/kg		3.91E+01	NoA
561	1	m,p-Xylene	1.00E-02	mg/kg		7.96E+00	NoA
561	1	Mercury	8.80E-02	mg/kg	2.00E-01	2.13E-01	NoAB
561	1	Methylene chloride	1.50E-02	mg/kg		3.65E+00	NoA
561	1	Molybdenum	4.80E+00	mg/kg		2.30E+01	NoA
561	1	Naphthalene	4.40E-01	mg/kg		1.15E+00	NoA
561	1	Nitrobenzene	2.10E+00	mg/kg		4.79E+00	NoA
561	1	N-Nitroso-di-n-propylamine	4.40E-01	mg/kg		1.89E-02	Yes
561	1	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
561	1	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
561	1	Phenanthrene	4.40E-01	mg/kg			NoC
561	1	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
561	1	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
561	1	Pyrene	4.40E-01	mg/kg		8.12E+01	NoA
561	1	Pyridine	8.80E-01	mg/kg		7.82E+00	NoA
561	1	Selenium	1.83E+01	mg/kg	8.00E-01	2.30E+01	NoA
561	1	Silver	1.20E+00	mg/kg	2.30E+00	2.61E+00	NoAB
561	1	Sodium	9.16E+01	mg/kg	3.20E+02		NoBE
561	1	Tetrachloroethene	5.00E-03	mg/kg		1.13E-01	NoA
561	1	Toluene	5.00E-03	mg/kg		9.61E+01	NoA
561	1	trans-1,2-Dichloroethene	5.00E-03	mg/kg		2.43E+00	NoA
561	1	Trichloroethene	5.00E-03	mg/kg		2.34E-02	NoA
561	1	Vinyl chloride	5.00E-03	mg/kg		8.24E-02	NoA
561	2	1,1,1,2-Tetrachloroethane	5.90E-03	mg/kg		1.86E+00	NoA
561	2	1,1,1-Trichloroethane	5.90E-03	mg/kg		1.46E+02	NoA
561	2	1,1,2,2-Tetrachloroethane	5.90E-03	mg/kg		5.62E-01	NoA
561	2	1,1,2-Trichloroethane	5.90E-03	mg/kg		2.30E-02	NoA
561	2	1,1-Dichloroethane	5.90E-03	mg/kg		1.34E+00	NoA
561	2	1,1-Dichloroethene	5.90E-03	mg/kg		2.37E-02	NoA
561	2	1,2,3-Trichloropropane	5.90E-03	mg/kg		4.97E-03	Yes
561	2	1,2,4-Trichlorobenzene	4.40E-01	mg/kg		7.86E-01	NoA
561	2	1,2-Dibromoethane	5.90E-03	mg/kg		3.37E-02	NoA
561	2	1,2-Dichlorobenzene	4.40E-01	mg/kg		2.92E+01	NoA
561	2	1,2-Dichloroethane	5.90E-03	mg/kg		1.55E-01	NoA
561	2	1,2-Dichloropropane	5.90E-03	mg/kg		9.40E-01	NoA
561	2	1,2-Dimethylbenzene	5.90E-03	mg/kg		5.35E+01	NoA
561	2	1,3-Dichlorobenzene	4.40E-01	mg/kg			NoC
561	2	1,4-Dichlorobenzene	4.90E-01	mg/kg		8.13E-01	NoA
561	2	2,4,5-Trichlorophenol	4.90E-01	mg/kg		3.26E+02	NoA
561	2	2,4,6-Trichlorophenol	4.90E-01	mg/kg		3.26E+00	NoA
561	2	2,4-Dichlorophenol	4.40E-01	mg/kg		9.78E+00	NoA
561	2	2,4-Dimethylphenol	4.40E-01	mg/kg		6.52E+01	NoA
561	2	2,4-Dinitrophenol	2.20E+00	mg/kg		6.52E+00	NoA
561	2	2,4-Dinitrotoluene	4.90E-01	mg/kg		5.63E-01	NoA
561	2	2,6-Dinitrotoluene	4.40E-01	mg/kg		3.26E+00	NoA
561	2	2-Butanone	2.30E-02	mg/kg		5.78E+02	NoA
561	2	2-Chloronaphthalene	4.40E-01	mg/kg		6.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
561	2	2-Chlorophenol	4.40E-01	mg/kg		3.91E+01	NoA
561	2	2-Hexanone	2.30E-02	mg/kg		4.05E+00	NoA
561	2	2-Methyl-4,6-dinitrophenol	2.20E+00	mg/kg		2.61E-01	Yes
561	2	2-Methylnaphthalene	4.90E-01	mg/kg		1.30E+01	NoA
561	2	2-Methylphenol	4.90E-01	mg/kg		1.54E+02	NoA
561	2	2-Nitrobenzenamine	2.20E+00	mg/kg		2.96E-01	Yes
561	2	2-Nitrophenol	4.40E-01	mg/kg			NoC
561	2	3,3'-Dichlorobenzidine	2.20E+00	mg/kg		3.85E-01	Yes
561	2	3-Nitrobenzenamine	2.20E+00	mg/kg		9.78E-01	Yes
561	2	4-Bromophenyl phenyl ether	4.40E-01	mg/kg			NoC
561	2	4-Chloro-3-methylphenol	4.40E-01	mg/kg			NoC
561	2	4-Chlorobenzenamine	4.40E-01	mg/kg		8.66E-01	NoA
561	2	4-Chlorophenyl phenyl ether	4.40E-01	mg/kg			NoC
561	2	4-Methyl-2-pentanone	2.30E-02	mg/kg		1.13E+02	NoA
561	2	4-Nitrophenol	2.20E+00	mg/kg			NoC
561	2	Acenaphthene	4.90E-01	mg/kg		1.17E+02	NoA
561	2	Acenaphthylene	4.40E-01	mg/kg			NoC
561	2	Acetone	1.80E-02	mg/kg		1.34E+03	NoA
561	2	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
561	2	Benzene	5.90E-03	mg/kg		3.33E-01	NoA
561	2	Benzenemethanol	4.40E-01	mg/kg		3.26E+02	NoA
561	2	Benzo(ghi)perylene	4.40E-01	mg/kg			NoC
561	2	Benzoic acid	2.20E+00	mg/kg		1.30E+04	NoA
561	2	Bis(2-chloroethoxy)methane	4.40E-01	mg/kg		9.78E+00	NoA
561	2	Bis(2-chloroethyl) ether	4.40E-01	mg/kg		2.14E-01	Yes
561	2	Bis(2-chloroisopropyl) ether	4.40E-01	mg/kg		4.57E+00	NoA
561	2	Bis(2-ethylhexyl)phthalate	4.40E-01	mg/kg		1.25E+01	NoA
561	2	Boron	4.68E+01	mg/kg		9.18E+02	NoA
561	2	Bromodichloromethane	5.90E-03	mg/kg		2.73E-01	NoA
561	2	Bromoform	5.90E-03	mg/kg		2.19E+01	NoA
561	2	Bromomethane	1.20E-02	mg/kg		1.34E-01	NoA
561	2	Butyl benzyl phthalate	4.40E-01	mg/kg		9.18E+01	NoA
561	2	Carbazole	4.90E-01	mg/kg		8.72E+00	NoA
561	2	Carbon disulfide	5.90E-03	mg/kg		1.48E+01	NoA
561	2	Carbon tetrachloride	5.90E-03	mg/kg		2.39E-01	NoA
561	2	Chlorobenzene	5.90E-03	mg/kg		4.07E+00	NoA
561	2	Chloroethane	1.20E-02	mg/kg		1.45E+03	NoA
561	2	Chloroform	5.90E-03	mg/kg		1.22E-01	NoA
561	2	Chloromethane	1.20E-02	mg/kg		1.65E+00	NoA
561	2	cis-1,2-Dichloroethene	5.90E-03	mg/kg		1.05E+00	NoA
561	2	cis-1,3-Dichloropropene	5.90E-03	mg/kg			NoC
561	2	Dibenzofuran	4.90E-01	mg/kg		3.26E+00	NoA
561	2	Dibromochloromethane	5.90E-03	mg/kg		2.42E-01	NoA
561	2	Dibromomethane	5.90E-03	mg/kg		2.46E+00	NoA
561	2	Dichlorodifluoromethane	1.20E-02	mg/kg		9.38E+00	NoA
561	2	Diethyl phthalate	4.90E-01	mg/kg		2.61E+03	NoA
561	2	Dimethyl phthalate	4.40E-01	mg/kg			NoC
561	2	Di-n-butyl phthalate	1.40E+00	mg/kg		3.26E+02	NoA
561	2	Di-n-octylphthalate	4.40E-01	mg/kg		1.30E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
561	2	Ethyl methacrylate	5.90E-03	mg/kg		1.52E+02	NoA
561	2	Ethylbenzene	5.90E-03	mg/kg		1.58E+00	NoA
561	2	Fluoranthene	4.60E-01	mg/kg		1.09E+02	NoA
561	2	Fluorene	4.90E-01	mg/kg		9.15E+01	NoA
561	2	Hexachlorobenzene	4.90E-01	mg/kg		4.92E-02	Yes
561	2	Hexachlorobutadiene	4.90E-01	mg/kg		2.22E+00	NoA
561	2	Hexachlorocyclopentadiene	2.20E+00	mg/kg		1.95E+01	NoA
561	2	Hexachloroethane	4.90E-01	mg/kg		2.28E+00	NoA
561	2	Iodomethane	5.90E-03	mg/kg			NoC
561	2	Isophorone	4.40E-01	mg/kg		1.82E+02	NoA
561	2	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
561	2	m,p-Cresol	8.90E-01	mg/kg		3.91E+01	NoA
561	2	m,p-Xylene	1.00E-02	mg/kg		7.96E+00	NoA
561	2	Mercury	9.70E-02	mg/kg	2.00E-01	2.13E-01	NoAB
561	2	Methylene chloride	1.60E-02	mg/kg		3.65E+00	NoA
561	2	Molybdenum	9.40E+00	mg/kg		2.30E+01	NoA
561	2	Naphthalene	4.90E-01	mg/kg		1.15E+00	NoA
561	2	Nitrobenzene	2.20E+00	mg/kg		4.79E+00	NoA
561	2	N-Nitroso-di-n-propylamine	4.40E-01	mg/kg		1.89E-02	Yes
561	2	N-Nitrosodiphenylamine	4.40E-01	mg/kg		3.22E+01	NoA
561	2	Pentachlorophenol	2.20E+00	mg/kg		4.36E-01	Yes
561	2	Phenanthrene	4.40E-01	mg/kg			NoC
561	2	Phenol	4.40E-01	mg/kg		4.98E+02	NoA
561	2	p-Nitroaniline	2.20E+00	mg/kg		8.66E+00	NoA
561	2	Pyrene	4.60E-01	mg/kg		8.12E+01	NoA
561	2	Pyridine	8.90E-01	mg/kg		7.82E+00	NoA
561	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
561	2	Silver	2.30E+00	mg/kg	2.30E+00	2.61E+00	NoA
561	2	Sodium	9.98E+01	mg/kg	3.20E+02		NoBE
561	2	Styrene	5.90E-03	mg/kg		9.43E+01	NoA
561	2	Tetrachloroethene	5.90E-03	mg/kg		1.13E-01	NoA
561	2	Toluene	5.00E-03	mg/kg		9.61E+01	NoA
561	2	trans-1,2-Dichloroethene	5.90E-03	mg/kg		2.43E+00	NoA
561	2	trans-1,3-Dichloropropene	5.90E-03	mg/kg			NoC
561	2	Trans-1,4-Dichloro-2-butene	1.20E-02	mg/kg		6.94E-03	Yes
561	2	Trichloroethene	5.90E-03	mg/kg		2.34E-02	NoA
561	2	Trichlorofluoromethane	5.90E-03	mg/kg		7.87E+01	NoA
561	2	Vinyl acetate	5.90E-03	mg/kg		1.83E+01	NoA
561	2	Vinyl chloride	5.90E-03	mg/kg		8.24E-02	NoA
562	1	Acenaphthene	4.90E-01	mg/kg		1.17E+02	NoA
562	1	Acenaphthylene	4.90E-01	mg/kg			NoC
562	1	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
562	1	Antimony	8.20E+00	mg/kg	2.10E-01	5.52E-01	Yes
562	1	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
562	1	Beryllium	4.88E-01	mg/kg	6.70E-01	5.67E-03	NoB
562	1	Cadmium	4.88E-01	mg/kg	2.10E-01	8.11E-01	NoA
562	1	Chromium	6.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
562	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
562	1	Fluorene	4.90E-01	mg/kg		9.15E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
562	1	Lead	8.00E+00	mg/kg	3.60E+01	4.00E+02	NoAB
562	1	Mercury	1.70E-02	mg/kg	2.00E-01	2.13E-01	NoAB
562	1	Molybdenum	4.88E+00	mg/kg		2.30E+01	NoA
562	1	Naphthalene	4.90E-01	mg/kg		1.15E+00	NoA
562	1	Nickel	4.88E+00	mg/kg	2.10E+01	1.04E+01	NoAB
562	1	PCB, Total	1.00E+00	mg/kg		6.48E-02	Yes
562	1	Phenanthrene	4.90E-01	mg/kg			NoC
562	1	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
562	1	Selenium	9.76E-01	mg/kg	8.00E-01	2.30E+01	NoA
562	1	Silver	2.05E+00	mg/kg	2.30E+00	2.61E+00	NoAB
562	1	Sodium	1.95E+02	mg/kg	3.20E+02		NoBE
562	1	Thallium	1.95E+00	mg/kg	2.10E-01	3.68E-01	Yes
562	1	Total PAH	4.90E-01	mg/kg		1.97E-02	Yes
562	1	Zinc	1.95E+01	mg/kg	6.50E+01	1.38E+03	NoAB
562	2	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
562	2	Acenaphthylene	5.00E-01	mg/kg			NoC
562	2	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
562	2	Antimony	8.30E+00	mg/kg	2.10E-01	5.52E-01	Yes
562	2	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
562	2	Beryllium	4.82E-01	mg/kg	6.70E-01	5.67E-03	NoB
562	2	Cadmium	4.82E-01	mg/kg	2.10E-01	8.11E-01	NoA
562	2	Chromium	6.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
562	2	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
562	2	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
562	2	Molybdenum	4.82E+00	mg/kg		2.30E+01	NoA
562	2	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
562	2	Nickel	4.82E+00	mg/kg	2.10E+01	1.04E+01	NoAB
562	2	Phenanthrene	5.00E-01	mg/kg			NoC
562	2	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
562	2	Selenium	9.65E-01	mg/kg	8.00E-01	2.30E+01	NoA
562	2	Silver	2.08E+00	mg/kg	2.30E+00	2.61E+00	NoAB
562	2	Sodium	1.93E+02	mg/kg	3.20E+02		NoBE
562	2	Thallium	1.93E+00	mg/kg	2.10E-01	3.68E-01	Yes
562	2	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
562	2	Uranium	8.00E+00	mg/kg	4.90E+00	1.38E+01	NoA
562	3	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
562	3	Acenaphthylene	5.00E-01	mg/kg			NoC
562	3	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
562	3	Antimony	7.72E+00	mg/kg	2.10E-01	5.52E-01	Yes
562	3	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
562	3	Beryllium	4.46E-01	mg/kg	6.70E-01	5.67E-03	NoB
562	3	Cadmium	4.46E-01	mg/kg	2.10E-01	8.11E-01	NoA
562	3	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
562	3	Mercury	1.50E-02	mg/kg	2.00E-01	2.13E-01	NoAB
562	3	Molybdenum	4.46E+00	mg/kg		2.30E+01	NoA
562	3	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
562	3	Selenium	8.93E-01	mg/kg	8.00E-01	2.30E+01	NoA
562	3	Silver	1.93E+00	mg/kg	2.30E+00	2.61E+00	NoAB
562	3	Sodium	1.79E+02	mg/kg	3.20E+02		NoBE

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
562	3	Thallium	1.79E+00	mg/kg	2.10E-01	3.68E-01	Yes
562	4	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
562	4	Acenaphthylene	5.00E-01	mg/kg			NoC
562	4	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
562	4	Antimony	8.13E+00	mg/kg	2.10E-01	5.52E-01	Yes
562	4	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
562	4	Beryllium	4.83E-01	mg/kg	6.70E-01	5.67E-03	NoB
562	4	Cadmium	4.83E-01	mg/kg	2.10E-01	8.11E-01	NoA
562	4	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
562	4	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
562	4	Molybdenum	4.83E+00	mg/kg		2.30E+01	NoA
562	4	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
562	4	PCB, Total	1.00E+00	mg/kg		6.48E-02	Yes
562	4	Phenanthrene	5.00E-01	mg/kg			NoC
562	4	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
562	4	Selenium	9.67E-01	mg/kg	8.00E-01	2.30E+01	NoA
562	4	Silver	2.03E+00	mg/kg	2.30E+00	2.61E+00	NoAB
562	4	Sodium	1.93E+02	mg/kg	3.20E+02		NoBE
562	4	Thallium	1.93E+00	mg/kg	2.10E-01	3.68E-01	Yes
562	4	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
562	5	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
562	5	Acenaphthylene	5.00E-01	mg/kg			NoC
562	5	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
562	5	Antimony	9.53E+00	mg/kg	2.10E-01	5.52E-01	Yes
562	5	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
562	5	Beryllium	4.93E-01	mg/kg	6.70E-01	5.67E-03	NoB
562	5	Cadmium	4.93E-01	mg/kg	2.10E-01	8.11E-01	NoA
562	5	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
562	5	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
562	5	Lead	8.00E+00	mg/kg	3.60E+01	4.00E+02	NoAB
562	5	Molybdenum	4.93E+00	mg/kg		2.30E+01	NoA
562	5	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
562	5	Phenanthrene	4.90E-01	mg/kg			NoC
562	5	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
562	5	Selenium	9.86E-01	mg/kg	8.00E-01	2.30E+01	NoA
562	5	Silver	2.38E+00	mg/kg	2.30E+00	2.61E+00	NoA
562	5	Sodium	1.97E+02	mg/kg	3.20E+02		NoBE
562	5	Thallium	1.97E+00	mg/kg	2.10E-01	3.68E-01	Yes
563	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
563	1	Acenaphthylene	5.00E-01	mg/kg			NoC
563	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
563	1	Antimony	8.26E+00	mg/kg	2.10E-01	5.52E-01	Yes
563	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
563	1	Beryllium	4.90E-01	mg/kg	6.70E-01	5.67E-03	NoB
563	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
563	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
563	1	Molybdenum	4.90E+00	mg/kg		2.30E+01	NoA
563	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
563	1	Phenanthrene	5.00E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
563	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
563	1	Selenium	9.79E-01	mg/kg	8.00E-01	2.30E+01	NoA
563	1	Silver	2.06E+00	mg/kg	2.30E+00	2.61E+00	NoAB
563	1	Sodium	1.96E+02	mg/kg	3.20E+02		NoBE
563	1	Thallium	1.96E+00	mg/kg	2.10E-01	3.68E-01	Yes
563	1	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
563	2	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
563	2	Acenaphthylene	5.00E-01	mg/kg			NoC
563	2	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
563	2	Antimony	7.85E+00	mg/kg	2.10E-01	5.52E-01	Yes
563	2	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
563	2	Beryllium	4.68E-01	mg/kg	6.70E-01	5.67E-03	NoB
563	2	Cadmium	4.68E-01	mg/kg	2.10E-01	8.11E-01	NoA
563	2	Chromium	6.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
563	2	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
563	2	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
563	2	Molybdenum	4.68E+00	mg/kg		2.30E+01	NoA
563	2	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
563	2	PCB, Total	1.00E+00	mg/kg		6.48E-02	Yes
563	2	Phenanthrene	5.00E-01	mg/kg			NoC
563	2	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
563	2	Selenium	9.36E-01	mg/kg	8.00E-01	2.30E+01	NoA
563	2	Silver	1.96E+00	mg/kg	2.30E+00	2.61E+00	NoAB
563	2	Sodium	1.87E+02	mg/kg	3.20E+02		NoBE
563	2	Thallium	1.87E+00	mg/kg	2.10E-01	3.68E-01	Yes
563	2	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
563	2	Uranium	8.00E+00	mg/kg	4.90E+00	1.38E+01	NoA
564	1	Acenaphthene	4.90E-01	mg/kg		1.17E+02	NoA
564	1	Acenaphthylene	4.90E-01	mg/kg			NoC
564	1	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
564	1	Antimony	8.83E+00	mg/kg	2.10E-01	5.52E-01	Yes
564	1	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
564	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
564	1	Fluorene	4.90E-01	mg/kg		9.15E+01	NoA
564	1	Naphthalene	4.90E-01	mg/kg		1.15E+00	NoA
564	1	Phenanthrene	4.90E-01	mg/kg			NoC
564	1	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
564	1	Silver	2.21E+00	mg/kg	2.30E+00	2.61E+00	NoAB
564	1	Sodium	1.95E+02	mg/kg	3.20E+02		NoBE
564	1	Total PAH	4.90E-01	mg/kg		1.97E-02	Yes
567	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
567	1	Acenaphthylene	5.00E-01	mg/kg			NoC
567	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
567	1	Antimony	7.91E+00	mg/kg	2.10E-01	5.52E-01	Yes
567	1	Arsenic	4.44E+00	mg/kg	1.20E+01	2.38E-01	NoB
567	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
567	1	Beryllium	4.69E-01	mg/kg	6.70E-01	5.67E-03	NoB
567	1	Cadmium	2.35E+00	mg/kg	2.10E-01	8.11E-01	Yes
567	1	Copper	1.17E+01	mg/kg	1.90E+01	1.84E+02	NoAB

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
567	1	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
567	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
567	1	Molybdenum	4.69E+00	mg/kg		2.30E+01	NoA
567	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
567	1	PCB, Total	1.30E-01	mg/kg		6.48E-02	Yes
567	1	Phenanthrene	5.00E-01	mg/kg			NoC
567	1	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
567	1	Selenium	4.69E+00	mg/kg	8.00E-01	2.30E+01	NoA
567	1	Silver	1.98E+00	mg/kg	2.30E+00	2.61E+00	NoAB
567	1	Sodium	1.88E+02	mg/kg	3.20E+02		NoBE
567	1	Thallium	9.38E+00	mg/kg	2.10E-01	3.68E-01	Yes
567	1	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
567	1	Uranium	4.69E+00	mg/kg	4.90E+00	1.38E+01	NoAB
567	2	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
567	2	1,1-Dichloroethene	4.00E-02	mg/kg		2.37E-02	Yes
567	2	Tetrachloroethene	5.00E-03	mg/kg		1.13E-01	NoA
567	2	Trichloroethene	5.00E-03	mg/kg		2.34E-02	NoA
567	3	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
567	3	Acenaphthylene	5.00E-01	mg/kg			NoC
567	3	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
567	3	Antimony	8.14E+00	mg/kg	2.10E-01	5.52E-01	Yes
567	3	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
567	3	Cadmium	2.27E+00	mg/kg	2.10E-01	8.11E-01	Yes
567	3	Copper	1.14E+01	mg/kg	1.90E+01	1.84E+02	NoAB
567	3	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
567	3	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
567	3	Molybdenum	4.54E+00	mg/kg		2.30E+01	NoA
567	3	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
567	3	PCB, Total	1.30E-01	mg/kg		6.48E-02	Yes
567	3	Phenanthrene	5.00E-01	mg/kg			NoC
567	3	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
567	3	Selenium	4.54E+00	mg/kg	8.00E-01	2.30E+01	NoA
567	3	Silver	2.04E+00	mg/kg	2.30E+00	2.61E+00	NoAB
567	3	Sodium	1.82E+02	mg/kg	3.20E+02		NoBE
567	3	Thallium	9.08E+00	mg/kg	2.10E-01	3.68E-01	Yes
567	3	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
567	3	Uranium	4.54E+00	mg/kg	4.90E+00	1.38E+01	NoAB
567	4	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
567	4	Acenaphthylene	5.00E-01	mg/kg			NoC
567	4	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
567	4	Antimony	8.18E+00	mg/kg	2.10E-01	5.52E-01	Yes
567	4	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
567	4	Beryllium	4.96E-01	mg/kg	6.70E-01	5.67E-03	NoB
567	4	Cadmium	2.48E+00	mg/kg	2.10E-01	8.11E-01	Yes
567	4	Copper	1.24E+01	mg/kg	1.90E+01	1.84E+02	NoAB
567	4	Fluoranthene	5.00E-01	mg/kg		1.09E+02	NoA
567	4	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
567	4	Molybdenum	4.96E+00	mg/kg		2.30E+01	NoA
567	4	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
567	4	PCB, Total	1.30E-01	mg/kg		6.48E-02	Yes
567	4	Phenanthrene	5.00E-01	mg/kg			NoC
567	4	Pyrene	5.00E-01	mg/kg		8.12E+01	NoA
567	4	Selenium	4.96E+00	mg/kg	8.00E-01	2.30E+01	NoA
567	4	Silver	2.05E+00	mg/kg	2.30E+00	2.61E+00	NoAB
567	4	Sodium	1.99E+02	mg/kg	3.20E+02		NoBE
567	4	Thallium	9.93E+00	mg/kg	2.10E-01	3.68E-01	Yes
567	4	Total PAH	5.00E-01	mg/kg		1.97E-02	Yes
567	4	Uranium	4.96E+00	mg/kg	4.90E+00	1.38E+01	NoA
14	1	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
14	1	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
14	1	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
14	1	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
14	1	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
14	1	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
14	1	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
14	1	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
14	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	1	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
14	1	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
14	1	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
14	1	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
14	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	1	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
14	1	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
14	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
14	1	2-Nitrophenol	3.40E-01	mg/kg			NoC
14	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	1	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
14	1	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
14	1	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
14	1	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
14	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	1	Acenaphthene	3.40E-01	mg/kg		1.17E+02	NoA
14	1	Acenaphthylene	3.40E-01	mg/kg			NoC
14	1	Anthracene	3.40E-01	mg/kg		7.47E+02	NoA
14	1	Antimony	5.20E-01	mg/kg	2.10E-01	5.52E-01	NoA
14	1	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
14	1	Benzo(ghi)perylene	3.40E-01	mg/kg			NoC
14	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	1	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
14	1	Bis(2-chloroethyl) ether	6.80E-03	mg/kg		2.14E-01	NoA
14	1	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
14	1	Bis(2-ethylhexyl)phthalate	3.40E-01	mg/kg		1.25E+01	NoA
14	1	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
14	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
14	1	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
14	1	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	1	Dimethyl phthalate	3.40E-01	mg/kg			NoC
14	1	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
14	1	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
14	1	Fluoranthene	3.40E-01	mg/kg		1.09E+02	NoA
14	1	Fluorene	3.40E-01	mg/kg		9.15E+01	NoA
14	1	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
14	1	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
14	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
14	1	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
14	1	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
14	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
14	1	m,p-Cresol	6.80E-01	mg/kg		3.91E+01	NoA
14	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
14	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	1	Naphthalene	3.40E-01	mg/kg		1.15E+00	NoA
14	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	1	N-Nitroso-di-n-propylamine	6.80E-03	mg/kg		1.89E-02	NoA
14	1	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
14	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
14	1	Phenanthrene	3.40E-01	mg/kg			NoC
14	1	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
14	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	1	Pyrene	3.40E-01	mg/kg		8.12E+01	NoA
14	1	Pyridine	6.80E-01	mg/kg		7.82E+00	NoA
14	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	1	Total PAH	6.80E-03	mg/kg		1.97E-02	NoA
14	2	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
14	2	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
14	2	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
14	2	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
14	2	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
14	2	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
14	2	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
14	2	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
14	2	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	2	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
14	2	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
14	2	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
14	2	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
14	2	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	2	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
14	2	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
14	2	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
14	2	2-Nitrophenol	3.40E-01	mg/kg			NoC
14	2	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	2	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	2	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
14	2	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
14	2	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	2	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
14	2	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	2	Acenaphthylene	3.40E-01	mg/kg			NoC
14	2	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
14	2	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	2	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
14	2	Bis(2-chloroethyl) ether	6.80E-03	mg/kg		2.14E-01	NoA
14	2	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
14	2	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
14	2	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
14	2	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
14	2	Dimethyl phthalate	3.40E-01	mg/kg			NoC
14	2	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
14	2	Fluorene	3.40E-01	mg/kg		9.15E+01	NoA
14	2	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
14	2	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
14	2	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
14	2	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
14	2	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
14	2	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
14	2	m,p-Cresol	6.80E-01	mg/kg		3.91E+01	NoA
14	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	2	Naphthalene	3.40E-01	mg/kg		1.15E+00	NoA
14	2	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	2	N-Nitroso-di-n-propylamine	6.80E-03	mg/kg		1.89E-02	NoA
14	2	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
14	2	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
14	2	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
14	2	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	2	Pyridine	6.80E-01	mg/kg		7.82E+00	NoA
14	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	2	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
14	3	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
14	3	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
14	3	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
14	3	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
14	3	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
14	3	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
14	3	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
14	3	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
14	3	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	3	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
14	3	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
14	3	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
14	3	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
14	3	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	3	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
14	3	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
14	3	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	3	2-Nitrophenol	3.40E-01	mg/kg			NoC
14	3	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	3	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	3	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
14	3	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
14	3	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
14	3	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
14	3	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	3	Acenaphthene	3.40E-01	mg/kg		1.17E+02	NoA
14	3	Acenaphthylene	3.40E-01	mg/kg			NoC
14	3	Anthracene	3.40E-01	mg/kg		7.47E+02	NoA
14	3	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
14	3	Benzo(ghi)perylene	3.40E-01	mg/kg			NoC
14	3	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	3	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
14	3	Bis(2-chloroethyl) ether	6.80E-03	mg/kg		2.14E-01	NoA
14	3	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
14	3	Bis(2-ethylhexyl)phthalate	3.40E-01	mg/kg		1.25E+01	NoA
14	3	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
14	3	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
14	3	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
14	3	Dimethyl phthalate	3.40E-01	mg/kg			NoC
14	3	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
14	3	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
14	3	Fluoranthene	3.40E-01	mg/kg		1.09E+02	NoA
14	3	Fluorene	3.40E-01	mg/kg		9.15E+01	NoA
14	3	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
14	3	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
14	3	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
14	3	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
14	3	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
14	3	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
14	3	m,p-Cresol	6.80E-01	mg/kg		3.91E+01	NoA
14	3	Naphthalene	3.40E-01	mg/kg		1.15E+00	NoA
14	3	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	3	N-Nitroso-di-n-propylamine	6.80E-03	mg/kg		1.89E-02	NoA
14	3	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
14	3	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
14	3	Phenanthrene	3.40E-01	mg/kg			NoC
14	3	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
14	3	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	3	Pyrene	3.40E-01	mg/kg		8.12E+01	NoA
14	3	Pyridine	6.80E-01	mg/kg		7.82E+00	NoA
14	3	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	3	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
14	3	Total PAH	6.80E-03	mg/kg		1.97E-02	NoA
14	4	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
14	4	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
14	4	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	4	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
14	4	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
14	4	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
14	4	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
14	4	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
14	4	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
14	4	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
14	4	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
14	4	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
14	4	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
14	4	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
14	4	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
14	4	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
14	4	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
14	4	2-Nitrophenol	3.70E-01	mg/kg			NoC
14	4	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
14	4	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
14	4	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
14	4	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
14	4	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
14	4	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
14	4	4-Nitrophenol	1.80E+00	mg/kg			NoC
14	4	Acenaphthene	3.70E-01	mg/kg		1.17E+02	NoA
14	4	Acenaphthylene	3.70E-01	mg/kg			NoC
14	4	Anthracene	3.70E-01	mg/kg		7.47E+02	NoA
14	4	Benzenemethanol	3.70E-01	mg/kg		3.26E+02	NoA
14	4	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
14	4	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
14	4	Bis(2-chloroethyl) ether	7.40E-03	mg/kg		2.14E-01	NoA
14	4	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
14	4	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
14	4	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
14	4	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
14	4	Dimethyl phthalate	3.70E-01	mg/kg			NoC
14	4	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
14	4	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
14	4	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
14	4	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
14	4	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
14	4	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
14	4	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
14	4	m,p-Cresol	7.40E-01	mg/kg		3.91E+01	NoA
14	4	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	4	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
14	4	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
14	4	N-Nitroso-di-n-propylamine	7.40E-03	mg/kg		1.89E-02	NoA
14	4	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
14	4	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
14	4	Phenol	3.70E-01	mg/kg		4.98E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	4	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
14	4	Pyridine	7.40E-01	mg/kg		7.82E+00	NoA
14	4	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	5	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
14	5	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
14	5	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
14	5	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
14	5	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
14	5	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
14	5	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
14	5	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
14	5	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
14	5	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
14	5	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
14	5	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
14	5	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
14	5	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
14	5	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
14	5	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
14	5	2-Nitrophenol	3.60E-01	mg/kg			NoC
14	5	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
14	5	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
14	5	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
14	5	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
14	5	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
14	5	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
14	5	4-Nitrophenol	1.80E+00	mg/kg			NoC
14	5	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
14	5	Acenaphthylene	3.60E-01	mg/kg			NoC
14	5	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
14	5	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
14	5	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
14	5	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
14	5	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
14	5	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
14	5	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
14	5	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
14	5	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
14	5	Dimethyl phthalate	3.60E-01	mg/kg			NoC
14	5	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
14	5	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
14	5	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
14	5	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
14	5	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
14	5	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
14	5	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
14	5	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
14	5	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
14	5	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	5	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	5	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
14	5	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
14	5	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
14	5	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
14	5	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
14	5	Phenanthrene	3.60E-01	mg/kg			NoC
14	5	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
14	5	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
14	5	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
14	5	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	5	Zinc	2.50E+01	mg/kg	6.50E+01	1.38E+03	NoAB
14	6	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
14	6	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
14	6	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
14	6	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
14	6	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
14	6	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
14	6	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
14	6	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
14	6	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	6	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
14	6	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
14	6	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
14	6	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
14	6	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	6	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
14	6	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
14	6	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
14	6	2-Nitrophenol	3.60E-01	mg/kg			NoC
14	6	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	6	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	6	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
14	6	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
14	6	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
14	6	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
14	6	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	6	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
14	6	Acenaphthylene	3.60E-01	mg/kg			NoC
14	6	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
14	6	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
14	6	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
14	6	Benzo(ghi)perylene	3.60E-01	mg/kg			NoC
14	6	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	6	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
14	6	Bis(2-chloroethyl) ether	7.20E-03	mg/kg		2.14E-01	NoA
14	6	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
14	6	Bis(2-ethylhexyl)phthalate	3.60E-01	mg/kg		1.25E+01	NoA
14	6	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	6	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
14	6	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
14	6	Dimethyl phthalate	3.60E-01	mg/kg			NoC
14	6	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
14	6	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
14	6	Fluoranthene	3.60E-01	mg/kg		1.09E+02	NoA
14	6	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
14	6	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
14	6	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
14	6	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
14	6	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
14	6	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
14	6	m,p-Cresol	7.20E-01	mg/kg		3.91E+01	NoA
14	6	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	6	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
14	6	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	6	N-Nitroso-di-n-propylamine	7.20E-03	mg/kg		1.89E-02	NoA
14	6	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
14	6	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
14	6	Phenanthrene	3.60E-01	mg/kg			NoC
14	6	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
14	6	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	6	Pyrene	3.60E-01	mg/kg		8.12E+01	NoA
14	6	Pyridine	7.20E-01	mg/kg		7.82E+00	NoA
14	6	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	7	1,2,4-Trichlorobenzene	4.00E-01	mg/kg		7.86E-01	NoA
14	7	1,2-Dichlorobenzene	4.00E-01	mg/kg		2.92E+01	NoA
14	7	1,3-Dichlorobenzene	4.00E-01	mg/kg			NoC
14	7	1,4-Dichlorobenzene	4.00E-01	mg/kg		8.13E-01	NoA
14	7	2,4,5-Trichlorophenol	4.00E-01	mg/kg		3.26E+02	NoA
14	7	2,4,6-Trichlorophenol	4.00E-01	mg/kg		3.26E+00	NoA
14	7	2,4-Dichlorophenol	4.00E-01	mg/kg		9.78E+00	NoA
14	7	2,4-Dimethylphenol	4.00E-01	mg/kg		6.52E+01	NoA
14	7	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
14	7	2,4-Dinitrotoluene	4.00E-01	mg/kg		5.63E-01	NoA
14	7	2,6-Dinitrotoluene	4.00E-01	mg/kg		3.26E+00	NoA
14	7	2-Chloronaphthalene	4.00E-01	mg/kg		6.26E+02	NoA
14	7	2-Chlorophenol	4.00E-01	mg/kg		3.91E+01	NoA
14	7	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
14	7	2-Methylnaphthalene	4.00E-01	mg/kg		1.30E+01	NoA
14	7	2-Methylphenol	4.00E-01	mg/kg		1.54E+02	NoA
14	7	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
14	7	2-Nitrophenol	4.00E-01	mg/kg			NoC
14	7	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
14	7	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
14	7	4-Bromophenyl phenyl ether	4.00E-01	mg/kg			NoC
14	7	4-Chloro-3-methylphenol	4.00E-01	mg/kg			NoC
14	7	4-Chlorobenzenamine	4.00E-01	mg/kg		8.66E-01	NoA
14	7	4-Chlorophenyl phenyl ether	4.00E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	7	4-Nitrophenol	1.90E+00	mg/kg			NoC
14	7	Acenaphthene	4.00E-01	mg/kg		1.17E+02	NoA
14	7	Acenaphthylene	4.00E-01	mg/kg			NoC
14	7	Benzenemethanol	4.00E-01	mg/kg		3.26E+02	NoA
14	7	Benzo(ghi)perylene	4.00E-01	mg/kg			NoC
14	7	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
14	7	Bis(2-chloroethoxy)methane	4.00E-01	mg/kg		9.78E+00	NoA
14	7	Bis(2-chloroethyl) ether	8.00E-03	mg/kg		2.14E-01	NoA
14	7	Bis(2-chloroisopropyl) ether	4.00E-01	mg/kg		4.57E+00	NoA
14	7	Bis(2-ethylhexyl)phthalate	4.00E-01	mg/kg		1.25E+01	NoA
14	7	Butyl benzyl phthalate	4.00E-01	mg/kg		9.18E+01	NoA
14	7	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
14	7	Dibenzofuran	4.00E-01	mg/kg		3.26E+00	NoA
14	7	Diethyl phthalate	4.00E-01	mg/kg		2.61E+03	NoA
14	7	Dimethyl phthalate	4.00E-01	mg/kg			NoC
14	7	Di-n-butyl phthalate	4.00E-01	mg/kg		3.26E+02	NoA
14	7	Di-n-octylphthalate	4.00E-01	mg/kg		1.30E+02	NoA
14	7	Fluorene	4.00E-01	mg/kg		9.15E+01	NoA
14	7	Hexachlorobenzene	4.00E-01	mg/kg		4.92E-02	Yes
14	7	Hexachlorobutadiene	4.00E-01	mg/kg		2.22E+00	NoA
14	7	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
14	7	Hexachloroethane	4.00E-01	mg/kg		2.28E+00	NoA
14	7	Isophorone	4.00E-01	mg/kg		1.82E+02	NoA
14	7	m,p-Cresol	8.00E-01	mg/kg		3.91E+01	NoA
14	7	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	7	Naphthalene	4.00E-01	mg/kg		1.15E+00	NoA
14	7	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
14	7	N-Nitroso-di-n-propylamine	8.00E-03	mg/kg		1.89E-02	NoA
14	7	N-Nitrosodiphenylamine	4.00E-01	mg/kg		3.22E+01	NoA
14	7	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
14	7	Phenanthrene	4.00E-01	mg/kg			NoC
14	7	Phenol	4.00E-01	mg/kg		4.98E+02	NoA
14	7	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
14	7	Pyridine	8.00E-01	mg/kg		7.82E+00	NoA
14	7	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	7	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
14	8	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
14	8	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
14	8	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
14	8	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
14	8	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
14	8	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
14	8	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
14	8	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
14	8	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	8	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
14	8	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
14	8	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
14	8	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	8	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	8	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
14	8	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
14	8	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
14	8	2-Nitrophenol	3.50E-01	mg/kg			NoC
14	8	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	8	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	8	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
14	8	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
14	8	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
14	8	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
14	8	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	8	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
14	8	Acenaphthylene	3.50E-01	mg/kg			NoC
14	8	Anthracene	3.50E-01	mg/kg		7.47E+02	NoA
14	8	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
14	8	Benzo(ghi)perylene	3.50E-01	mg/kg			NoC
14	8	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	8	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
14	8	Bis(2-chloroethyl) ether	7.00E-03	mg/kg		2.14E-01	NoA
14	8	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
14	8	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
14	8	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
14	8	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
14	8	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
14	8	Dimethyl phthalate	3.50E-01	mg/kg			NoC
14	8	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
14	8	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
14	8	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
14	8	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
14	8	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
14	8	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
14	8	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
14	8	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
14	8	m,p-Cresol	7.00E-01	mg/kg		3.91E+01	NoA
14	8	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	8	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
14	8	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	8	N-Nitroso-di-n-propylamine	7.00E-03	mg/kg		1.89E-02	NoA
14	8	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
14	8	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
14	8	Phenanthrene	3.50E-01	mg/kg			NoC
14	8	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
14	8	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	8	Pyridine	7.00E-01	mg/kg		7.82E+00	NoA
14	8	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	9	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
14	9	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
14	9	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	9	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
14	9	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
14	9	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
14	9	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
14	9	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
14	9	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	9	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
14	9	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
14	9	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
14	9	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
14	9	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	9	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
14	9	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
14	9	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
14	9	2-Nitrophenol	3.50E-01	mg/kg			NoC
14	9	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	9	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	9	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
14	9	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
14	9	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
14	9	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
14	9	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	9	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
14	9	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
14	9	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	9	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
14	9	Bis(2-chloroethyl) ether	7.10E-03	mg/kg		2.14E-01	NoA
14	9	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
14	9	Bis(2-ethylhexyl)phthalate	3.50E-01	mg/kg		1.25E+01	NoA
14	9	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
14	9	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
14	9	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
14	9	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
14	9	Dimethyl phthalate	3.50E-01	mg/kg			NoC
14	9	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
14	9	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
14	9	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
14	9	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
14	9	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
14	9	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
14	9	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
14	9	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
14	9	m,p-Cresol	7.10E-01	mg/kg		3.91E+01	NoA
14	9	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	9	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
14	9	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	9	N-Nitroso-di-n-propylamine	7.10E-03	mg/kg		1.89E-02	NoA
14	9	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
14	9	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	9	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
14	9	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	9	Pyridine	7.10E-01	mg/kg		7.82E+00	NoA
14	9	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	9	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
14	10	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
14	10	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
14	10	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
14	10	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
14	10	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
14	10	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
14	10	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
14	10	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
14	10	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
14	10	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
14	10	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
14	10	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
14	10	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
14	10	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
14	10	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
14	10	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
14	10	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
14	10	2-Nitrophenol	3.50E-01	mg/kg			NoC
14	10	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
14	10	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
14	10	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
14	10	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
14	10	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
14	10	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
14	10	4-Nitrophenol	1.70E+00	mg/kg			NoC
14	10	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
14	10	Acenaphthylene	3.50E-01	mg/kg			NoC
14	10	Anthracene	3.50E-01	mg/kg		7.47E+02	NoA
14	10	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
14	10	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
14	10	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
14	10	Bis(2-chloroethyl) ether	7.00E-03	mg/kg		2.14E-01	NoA
14	10	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
14	10	Bis(2-ethylhexyl)phthalate	3.50E-01	mg/kg		1.25E+01	NoA
14	10	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
14	10	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
14	10	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
14	10	Dimethyl phthalate	3.50E-01	mg/kg			NoC
14	10	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
14	10	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
14	10	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
14	10	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
14	10	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
14	10	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
14	10	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
14	10	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
14	10	m,p-Cresol	7.00E-01	mg/kg		3.91E+01	NoA
14	10	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
14	10	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
14	10	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
14	10	N-Nitroso-di-n-propylamine	7.00E-03	mg/kg		1.89E-02	NoA
14	10	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
14	10	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
14	10	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
14	10	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
14	10	Pyridine	7.00E-01	mg/kg		7.82E+00	NoA
14	10	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
14	10	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
518	1	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
518	1	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
518	1	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
518	1	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
518	1	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
518	1	1,2,4-Trichlorobenzene	2.40E+00	mg/kg		7.86E-01	Yes
518	1	1,2-Dichlorobenzene	2.40E+00	mg/kg		2.92E+01	NoA
518	1	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
518	1	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
518	1	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
518	1	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
518	1	1,3-Dichlorobenzene	2.40E+00	mg/kg			NoC
518	1	1,4-Dichlorobenzene	2.40E+00	mg/kg		8.13E-01	Yes
518	1	2,4,5-Trichlorophenol	2.40E+00	mg/kg		3.26E+02	NoA
518	1	2,4,6-Trichlorophenol	2.40E+00	mg/kg		3.26E+00	NoA
518	1	2,4-Dichlorophenol	2.40E+00	mg/kg		9.78E+00	NoA
518	1	2,4-Dimethylphenol	2.40E+00	mg/kg		6.52E+01	NoA
518	1	2,4-Dinitrophenol	2.40E+00	mg/kg		6.52E+00	NoA
518	1	2,4-Dinitrotoluene	2.40E+00	mg/kg		5.63E-01	Yes
518	1	2,6-Dinitrotoluene	2.40E+00	mg/kg		3.26E+00	NoA
518	1	2-Butanone	1.20E-02	mg/kg		5.78E+02	NoA
518	1	2-Chloronaphthalene	2.40E+00	mg/kg		6.26E+02	NoA
518	1	2-Chlorophenol	2.40E+00	mg/kg		3.91E+01	NoA
518	1	2-Hexanone	1.20E-02	mg/kg		4.05E+00	NoA
518	1	2-Methyl-4,6-dinitrophenol	2.40E+00	mg/kg		2.61E-01	Yes
518	1	2-Methylnaphthalene	2.40E+00	mg/kg		1.30E+01	NoA
518	1	2-Methylphenol	2.40E+00	mg/kg		1.54E+02	NoA
518	1	2-Nitrobenzenamine	2.40E+00	mg/kg		2.96E-01	Yes
518	1	2-Nitrophenol	2.40E+00	mg/kg			NoC
518	1	3,3'-Dichlorobenzidine	2.40E+00	mg/kg		3.85E-01	Yes
518	1	3-Nitrobenzenamine	2.40E+00	mg/kg		9.78E-01	Yes
518	1	4-Bromophenyl phenyl ether	2.40E+00	mg/kg			NoC
518	1	4-Chloro-3-methylphenol	2.40E+00	mg/kg			NoC
518	1	4-Chlorobenzenamine	2.40E+00	mg/kg		8.66E-01	Yes
518	1	4-Chlorophenyl phenyl ether	2.40E+00	mg/kg			NoC

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
518	1	4-Methyl-2-pentanone	1.20E-02	mg/kg		1.13E+02	NoA
518	1	4-Nitrophenol	2.40E+00	mg/kg			NoC
518	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
518	1	Acenaphthylene	2.40E+00	mg/kg			NoC
518	1	Acetone	1.90E-02	mg/kg		1.34E+03	NoA
518	1	Anthracene	5.00E-01	mg/kg		7.47E+02	NoA
518	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
518	1	Arsenic	5.00E+00	mg/kg	1.20E+01	2.38E-01	NoB
518	1	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
518	1	Benzenemethanol	3.90E-01	mg/kg		3.26E+02	NoA
518	1	Benzo(ghi)perylene	5.00E-01	mg/kg			NoC
518	1	Benzoic acid	2.00E+00	mg/kg		1.30E+04	NoA
518	1	Beryllium	5.00E-01	mg/kg	6.70E-01	5.67E-03	NoB
518	1	Bis(2-chloroethoxy)methane	2.40E+00	mg/kg		9.78E+00	NoA
518	1	Bis(2-chloroethyl) ether	2.40E+00	mg/kg		2.14E-01	Yes
518	1	Bis(2-chloroisopropyl) ether	2.40E+00	mg/kg		4.57E+00	NoA
518	1	Bis(2-ethylhexyl)phthalate	5.00E-01	mg/kg		1.25E+01	NoA
518	1	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
518	1	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
518	1	Bromomethane	1.20E-02	mg/kg		1.34E-01	NoA
518	1	Butyl benzyl phthalate	2.40E+00	mg/kg		9.18E+01	NoA
518	1	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
518	1	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
518	1	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
518	1	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
518	1	Chloroethane	1.20E-02	mg/kg		1.45E+03	NoA
518	1	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
518	1	Chloromethane	1.20E-02	mg/kg		1.65E+00	NoA
518	1	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
518	1	Dibenzofuran	3.90E-01	mg/kg		3.26E+00	NoA
518	1	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA
518	1	Diethyl phthalate	5.00E-01	mg/kg		2.61E+03	NoA
518	1	Dimethyl phthalate	5.00E-01	mg/kg			NoC
518	1	Di-n-butyl phthalate	5.00E-01	mg/kg		3.26E+02	NoA
518	1	Di-n-octylphthalate	2.40E+00	mg/kg		1.30E+02	NoA
518	1	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
518	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
518	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
518	1	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
518	1	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
518	1	Hexachlorocyclopentadiene	2.40E+00	mg/kg		1.95E+01	NoA
518	1	Hexachloroethane	2.40E+00	mg/kg		2.28E+00	Yes
518	1	Isophorone	2.40E+00	mg/kg		1.82E+02	NoA
518	1	Lead	2.00E+02	mg/kg	3.60E+01	4.00E+02	NoA
518	1	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
518	1	Mercury	2.00E-01	mg/kg	2.00E-01	2.13E-01	NoA
518	1	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
518	1	Molybdenum	2.21E+00	mg/kg		2.30E+01	NoA
518	1	Naphthalene	2.40E+00	mg/kg		1.15E+00	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
518	1	Nitrobenzene	2.40E+00	mg/kg		4.79E+00	NoA
518	1	N-Nitroso-di-n-propylamine	2.40E+00	mg/kg		1.89E-02	Yes
518	1	N-Nitrosodiphenylamine	2.40E+00	mg/kg		3.22E+01	NoA
518	1	Pentachlorophenol	2.40E+00	mg/kg		4.36E-01	Yes
518	1	Phenanthrene	5.00E-01	mg/kg			NoC
518	1	Phenol	2.40E+00	mg/kg		4.98E+02	NoA
518	1	p-Nitroaniline	2.40E+00	mg/kg		8.66E+00	NoA
518	1	Pyridine	2.40E+00	mg/kg		7.82E+00	NoA
518	1	Selenium	1.77E+01	mg/kg	8.00E-01	2.30E+01	NoA
518	1	Silver	4.00E+00	mg/kg	2.30E+00	2.61E+00	Yes
518	1	Sodium	8.85E+01	mg/kg	3.20E+02		NoBE
518	1	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
518	1	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
518	1	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
518	1	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
518	1	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
518	1	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
518	1	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
518	1	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
518	1	Vinyl acetate	1.20E-02	mg/kg		1.83E+01	NoA
518	1	Vinyl chloride	1.20E-02	mg/kg		8.24E-02	NoA
518	1	Zinc	2.00E+02	mg/kg	6.50E+01	1.38E+03	NoA
520	1	1,1,1-Trichloroethane	5.00E-03	mg/kg		1.46E+02	NoA
520	1	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
520	1	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
520	1	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
520	1	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
520	1	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
520	1	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
520	1	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
520	1	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
520	1	2,4-Dinitrophenol	1.60E+00	mg/kg		6.52E+00	NoA
520	1	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
520	1	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
520	1	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
520	1	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
520	1	2-Methyl-4,6-dinitrophenol	1.60E+00	mg/kg		2.61E-01	Yes
520	1	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
520	1	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
520	1	2-Nitrobenzenamine	1.60E+00	mg/kg		2.96E-01	Yes
520	1	2-Nitrophenol	3.40E-01	mg/kg			NoC
520	1	3,3'-Dichlorobenzidine	1.60E+00	mg/kg		3.85E-01	Yes
520	1	3-Nitrobenzenamine	1.60E+00	mg/kg		9.78E-01	Yes
520	1	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
520	1	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
520	1	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
520	1	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
520	1	4-Nitrophenol	1.60E+00	mg/kg			NoC
520	1	Acenaphthene	4.90E-01	mg/kg		1.17E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	1	Acenaphthylene	4.90E-01	mg/kg			NoC
520	1	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
520	1	Antimony	9.30E+00	mg/kg	2.10E-01	5.52E-01	Yes
520	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
520	1	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
520	1	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
520	1	Benzoic acid	1.60E+00	mg/kg		1.30E+04	NoA
520	1	Beryllium	4.65E-01	mg/kg	6.70E-01	5.67E-03	NoB
520	1	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
520	1	Bis(2-chloroethyl) ether	6.80E-03	mg/kg		2.14E-01	NoA
520	1	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
520	1	Bis(2-ethylhexyl)phthalate	3.40E-01	mg/kg		1.25E+01	NoA
520	1	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
520	1	Cadmium	1.86E+00	mg/kg	2.10E-01	8.11E-01	Yes
520	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
520	1	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
520	1	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
520	1	Dimethyl phthalate	3.40E-01	mg/kg			NoC
520	1	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA
520	1	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
520	1	Fluoranthene	4.90E-01	mg/kg		1.09E+02	NoA
520	1	Fluorene	4.90E-01	mg/kg		9.15E+01	NoA
520	1	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
520	1	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
520	1	Hexachlorocyclopentadiene	1.60E+00	mg/kg		1.95E+01	NoA
520	1	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
520	1	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
520	1	Lead	1.86E+01	mg/kg	3.60E+01	4.00E+02	NoAB
520	1	m,p-Cresol	6.80E-01	mg/kg		3.91E+01	NoA
520	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
520	1	Naphthalene	4.90E-01	mg/kg		1.15E+00	NoA
520	1	Nitrobenzene	1.60E+00	mg/kg		4.79E+00	NoA
520	1	N-Nitroso-di-n-propylamine	6.80E-03	mg/kg		1.89E-02	NoA
520	1	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
520	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
520	1	Pentachlorophenol	1.60E+00	mg/kg		4.36E-01	Yes
520	1	Phenanthrene	4.90E-01	mg/kg			NoC
520	1	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
520	1	p-Nitroaniline	1.60E+00	mg/kg		8.66E+00	NoA
520	1	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
520	1	Pyridine	6.80E-01	mg/kg		7.82E+00	NoA
520	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
520	1	Sodium	9.30E+01	mg/kg	3.20E+02		NoBE
520	1	Thallium	1.86E+01	mg/kg	2.10E-01	3.68E-01	Yes
520	1	Trichloroethene	5.00E-03	mg/kg		2.34E-02	NoA
520	1	Zinc	1.86E+01	mg/kg	6.50E+01	1.38E+03	NoAB
520	2	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
520	2	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
520	2	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	2	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
520	2	1,1-Dichloroethene	1.00E-02	mg/kg		2.37E-02	NoA
520	2	1,2,4-Trichlorobenzene	5.00E-01	mg/kg		7.86E-01	NoA
520	2	1,2-Dichlorobenzene	5.00E-01	mg/kg		2.92E+01	NoA
520	2	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
520	2	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
520	2	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
520	2	1,3-Dichlorobenzene	5.00E-01	mg/kg			NoC
520	2	1,4-Dichlorobenzene	5.00E-01	mg/kg		8.13E-01	NoA
520	2	2,4,5-Trichlorophenol	5.00E-01	mg/kg		3.26E+02	NoA
520	2	2,4,6-Trichlorophenol	5.00E-01	mg/kg		3.26E+00	NoA
520	2	2,4-Dichlorophenol	5.00E-01	mg/kg		9.78E+00	NoA
520	2	2,4-Dimethylphenol	5.00E-01	mg/kg		6.52E+01	NoA
520	2	2,4-Dinitrophenol	1.60E+00	mg/kg		6.52E+00	NoA
520	2	2,4-Dinitrotoluene	5.00E-01	mg/kg		5.63E-01	NoA
520	2	2,6-Dinitrotoluene	5.00E-01	mg/kg		3.26E+00	NoA
520	2	2-Butanone	1.00E-02	mg/kg		5.78E+02	NoA
520	2	2-Chloronaphthalene	5.00E-01	mg/kg		6.26E+02	NoA
520	2	2-Chlorophenol	5.00E-01	mg/kg		3.91E+01	NoA
520	2	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
520	2	2-Methyl-4,6-dinitrophenol	1.60E+00	mg/kg		2.61E-01	Yes
520	2	2-Methylnaphthalene	5.00E-01	mg/kg		1.30E+01	NoA
520	2	2-Methylphenol	5.00E-01	mg/kg		1.54E+02	NoA
520	2	2-Nitrobenzenamine	1.60E+00	mg/kg		2.96E-01	Yes
520	2	2-Nitrophenol	5.00E-01	mg/kg			NoC
520	2	3,3'-Dichlorobenzidine	1.60E+00	mg/kg		3.85E-01	Yes
520	2	3-Nitrobenzenamine	1.60E+00	mg/kg		9.78E-01	Yes
520	2	4-Bromophenyl phenyl ether	5.00E-01	mg/kg			NoC
520	2	4-Chloro-3-methylphenol	5.00E-01	mg/kg			NoC
520	2	4-Chlorobenzenamine	5.00E-01	mg/kg		8.66E-01	NoA
520	2	4-Chlorophenyl phenyl ether	5.00E-01	mg/kg			NoC
520	2	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
520	2	4-Methylphenol	5.00E-01	mg/kg		3.26E+02	NoA
520	2	4-Nitrophenol	1.60E+00	mg/kg			NoC
520	2	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
520	2	Acenaphthylene	5.00E-01	mg/kg			NoC
520	2	Acetone	1.00E-02	mg/kg		1.34E+03	NoA
520	2	Anthracene	4.90E-01	mg/kg		7.47E+02	NoA
520	2	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
520	2	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
520	2	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
520	2	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
520	2	Benzo(ghi)perylene	4.90E-01	mg/kg			NoC
520	2	Benzoic acid	1.60E+00	mg/kg		1.30E+04	NoA
520	2	Bis(2-chloroethoxy)methane	5.00E-01	mg/kg		9.78E+00	NoA
520	2	Bis(2-chloroethyl) ether	5.00E-01	mg/kg		2.14E-01	Yes
520	2	Bis(2-chloroisopropyl) ether	5.00E-01	mg/kg		4.57E+00	NoA
520	2	Bis(2-ethylhexyl)phthalate	4.90E-01	mg/kg		1.25E+01	NoA
520	2	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	2	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
520	2	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
520	2	Butyl benzyl phthalate	4.90E-01	mg/kg		9.18E+01	NoA
520	2	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
520	2	Carbazole	5.00E-01	mg/kg		8.72E+00	NoA
520	2	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
520	2	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
520	2	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
520	2	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
520	2	Cyanide	1.00E+00	mg/kg		4.69E+00	NoA
520	2	Dibenzofuran	5.00E-01	mg/kg		3.26E+00	NoA
520	2	Diethyl phthalate	5.00E-01	mg/kg		2.61E+03	NoA
520	2	Dimethyl phthalate	5.00E-01	mg/kg			NoC
520	2	Di-n-butyl phthalate	5.00E-01	mg/kg		3.26E+02	NoA
520	2	Di-n-octylphthalate	5.00E-01	mg/kg		1.30E+02	NoA
520	2	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
520	2	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
520	2	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
520	2	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
520	2	Hexachlorocyclopentadiene	1.60E+00	mg/kg		1.95E+01	NoA
520	2	Hexachloroethane	5.00E-01	mg/kg		2.28E+00	NoA
520	2	Isophorone	5.00E-01	mg/kg		1.82E+02	NoA
520	2	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
520	2	m,p-Cresol	6.80E-01	mg/kg		3.91E+01	NoA
520	2	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
520	2	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
520	2	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
520	2	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
520	2	Nitrobenzene	1.60E+00	mg/kg		4.79E+00	NoA
520	2	N-Nitroso-di-n-propylamine	5.00E-01	mg/kg		1.89E-02	Yes
520	2	N-Nitrosodiphenylamine	5.00E-01	mg/kg		3.22E+01	NoA
520	2	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
520	2	Pentachlorophenol	1.60E+00	mg/kg		4.36E-01	Yes
520	2	Phenanthrene	4.90E-01	mg/kg			NoC
520	2	Phenol	5.00E-01	mg/kg		4.98E+02	NoA
520	2	p-Nitroaniline	1.60E+00	mg/kg		8.66E+00	NoA
520	2	Pyrene	4.90E-01	mg/kg		8.12E+01	NoA
520	2	Pyridine	6.80E-01	mg/kg		7.82E+00	NoA
520	2	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
520	2	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
520	2	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
520	2	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
520	2	Thallium	2.00E+01	mg/kg	2.10E-01	3.68E-01	Yes
520	2	Tin	1.00E+03	mg/kg		4.69E+03	NoA
520	2	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
520	2	trans-1,2-Dichloroethene	1.00E-02	mg/kg		2.43E+00	NoA
520	2	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
520	2	Trichloroethene	1.00E-02	mg/kg		2.34E-02	NoA
520	3	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	3	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
520	3	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
520	3	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
520	3	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
520	3	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
520	3	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
520	3	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
520	3	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
520	3	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
520	3	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
520	3	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
520	3	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
520	3	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
520	3	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
520	3	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
520	3	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
520	3	2-Nitrophenol	3.50E-01	mg/kg			NoC
520	3	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
520	3	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
520	3	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
520	3	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
520	3	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
520	3	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
520	3	4-Nitrophenol	1.70E+00	mg/kg			NoC
520	3	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
520	3	Acenaphthylene	3.50E-01	mg/kg			NoC
520	3	Anthracene	3.50E-01	mg/kg		7.47E+02	NoA
520	3	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
520	3	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
520	3	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
520	3	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
520	3	Bis(2-chloroethyl) ether	7.00E-03	mg/kg		2.14E-01	NoA
520	3	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA
520	3	Bis(2-ethylhexyl)phthalate	3.50E-01	mg/kg		1.25E+01	NoA
520	3	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
520	3	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
520	3	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
520	3	Dimethyl phthalate	3.50E-01	mg/kg			NoC
520	3	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
520	3	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
520	3	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
520	3	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
520	3	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
520	3	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
520	3	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
520	3	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
520	3	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
520	3	m,p-Cresol	7.00E-01	mg/kg		3.91E+01	NoA
520	3	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	3	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
520	3	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
520	3	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
520	3	N-Nitroso-di-n-propylamine	7.00E-03	mg/kg		1.89E-02	NoA
520	3	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
520	3	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
520	3	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
520	3	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
520	3	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
520	3	Pyridine	7.00E-01	mg/kg		7.82E+00	NoA
520	3	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
520	4	1,2,4-Trichlorobenzene	3.40E-01	mg/kg		7.86E-01	NoA
520	4	1,2-Dichlorobenzene	3.40E-01	mg/kg		2.92E+01	NoA
520	4	1,3-Dichlorobenzene	3.40E-01	mg/kg			NoC
520	4	1,4-Dichlorobenzene	3.40E-01	mg/kg		8.13E-01	NoA
520	4	2,4,5-Trichlorophenol	3.40E-01	mg/kg		3.26E+02	NoA
520	4	2,4,6-Trichlorophenol	3.40E-01	mg/kg		3.26E+00	NoA
520	4	2,4-Dichlorophenol	3.40E-01	mg/kg		9.78E+00	NoA
520	4	2,4-Dimethylphenol	3.40E-01	mg/kg		6.52E+01	NoA
520	4	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
520	4	2,4-Dinitrotoluene	3.40E-01	mg/kg		5.63E-01	NoA
520	4	2,6-Dinitrotoluene	3.40E-01	mg/kg		3.26E+00	NoA
520	4	2-Chloronaphthalene	3.40E-01	mg/kg		6.26E+02	NoA
520	4	2-Chlorophenol	3.40E-01	mg/kg		3.91E+01	NoA
520	4	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
520	4	2-Methylnaphthalene	3.40E-01	mg/kg		1.30E+01	NoA
520	4	2-Methylphenol	3.40E-01	mg/kg		1.54E+02	NoA
520	4	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
520	4	2-Nitrophenol	3.40E-01	mg/kg			NoC
520	4	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
520	4	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
520	4	4-Bromophenyl phenyl ether	3.40E-01	mg/kg			NoC
520	4	4-Chloro-3-methylphenol	3.40E-01	mg/kg			NoC
520	4	4-Chlorobenzenamine	3.40E-01	mg/kg		8.66E-01	NoA
520	4	4-Chlorophenyl phenyl ether	3.40E-01	mg/kg			NoC
520	4	4-Nitrophenol	1.70E+00	mg/kg			NoC
520	4	Acenaphthene	3.40E-01	mg/kg		1.17E+02	NoA
520	4	Acenaphthylene	3.40E-01	mg/kg			NoC
520	4	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
520	4	Benzenemethanol	3.40E-01	mg/kg		3.26E+02	NoA
520	4	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
520	4	Bis(2-chloroethoxy)methane	3.40E-01	mg/kg		9.78E+00	NoA
520	4	Bis(2-chloroethyl) ether	6.90E-03	mg/kg		2.14E-01	NoA
520	4	Bis(2-chloroisopropyl) ether	3.40E-01	mg/kg		4.57E+00	NoA
520	4	Butyl benzyl phthalate	3.40E-01	mg/kg		9.18E+01	NoA
520	4	Dibenzofuran	3.40E-01	mg/kg		3.26E+00	NoA
520	4	Diethyl phthalate	3.40E-01	mg/kg		2.61E+03	NoA
520	4	Dimethyl phthalate	3.40E-01	mg/kg			NoC
520	4	Di-n-butyl phthalate	3.40E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	4	Di-n-octylphthalate	3.40E-01	mg/kg		1.30E+02	NoA
520	4	Fluorene	3.40E-01	mg/kg		9.15E+01	NoA
520	4	Hexachlorobenzene	3.40E-01	mg/kg		4.92E-02	Yes
520	4	Hexachlorobutadiene	3.40E-01	mg/kg		2.22E+00	NoA
520	4	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
520	4	Hexachloroethane	3.40E-01	mg/kg		2.28E+00	NoA
520	4	Isophorone	3.40E-01	mg/kg		1.82E+02	NoA
520	4	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
520	4	m,p-Cresol	6.90E-01	mg/kg		3.91E+01	NoA
520	4	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
520	4	Naphthalene	3.40E-01	mg/kg		1.15E+00	NoA
520	4	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
520	4	N-Nitroso-di-n-propylamine	6.90E-03	mg/kg		1.89E-02	NoA
520	4	N-Nitrosodiphenylamine	3.40E-01	mg/kg		3.22E+01	NoA
520	4	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
520	4	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
520	4	Phenol	3.40E-01	mg/kg		4.98E+02	NoA
520	4	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
520	4	Pyridine	6.90E-01	mg/kg		7.82E+00	NoA
520	4	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
520	5	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
520	5	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
520	5	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
520	5	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
520	5	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
520	5	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA
520	5	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
520	5	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
520	5	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
520	5	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
520	5	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
520	5	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
520	5	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
520	5	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
520	5	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
520	5	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
520	5	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
520	5	2-Nitrophenol	3.60E-01	mg/kg			NoC
520	5	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
520	5	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
520	5	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
520	5	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
520	5	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
520	5	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
520	5	4-Nitrophenol	1.80E+00	mg/kg			NoC
520	5	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
520	5	Acenaphthylene	3.60E-01	mg/kg			NoC
520	5	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
520	5	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
520	5	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
520	5	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
520	5	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
520	5	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
520	5	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
520	5	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
520	5	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
520	5	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
520	5	Dimethyl phthalate	3.60E-01	mg/kg			NoC
520	5	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
520	5	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
520	5	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
520	5	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
520	5	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
520	5	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
520	5	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
520	5	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
520	5	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA
520	5	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
520	5	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
520	5	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
520	5	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
520	5	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
520	5	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
520	5	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
520	5	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
520	5	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
520	5	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
520	5	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
520	5	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
520	5	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
520	5	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
81	1	1,1,1-Trichloroethane	6.00E-03	mg/kg		1.46E+02	NoA
81	1	1,1,2,2-Tetrachloroethane	6.00E-03	mg/kg		5.62E-01	NoA
81	1	1,1,2-Trichloroethane	6.00E-03	mg/kg		2.30E-02	NoA
81	1	1,1-Dichloroethane	6.00E-03	mg/kg		1.34E+00	NoA
81	1	1,1-Dichloroethene	6.00E-03	mg/kg		2.37E-02	NoA
81	1	1,2,4-Trichlorobenzene	4.20E-01	mg/kg		7.86E-01	NoA
81	1	1,2-Dichlorobenzene	4.20E-01	mg/kg		2.92E+01	NoA
81	1	1,2-Dichloroethane	6.00E-03	mg/kg		1.55E-01	NoA
81	1	1,2-Dichloroethene	6.00E-03	mg/kg		1.24E+00	NoA
81	1	1,2-Dichloropropane	6.00E-03	mg/kg		9.40E-01	NoA
81	1	1,3-Dichlorobenzene	4.20E-01	mg/kg			NoC
81	1	1,4-Dichlorobenzene	4.20E-01	mg/kg		8.13E-01	NoA
81	1	2,4,5-Trichlorophenol	2.10E+00	mg/kg		3.26E+02	NoA
81	1	2,4,6-Trichlorophenol	4.20E-01	mg/kg		3.26E+00	NoA
81	1	2,4-Dichlorophenol	4.20E-01	mg/kg		9.78E+00	NoA
81	1	2,4-Dimethylphenol	4.20E-01	mg/kg		6.52E+01	NoA
81	1	2,4-Dinitrophenol	2.10E+00	mg/kg		6.52E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
81	1	2,4-Dinitrotoluene	4.20E-01	mg/kg		5.63E-01	NoA
81	1	2,6-Dinitrotoluene	4.20E-01	mg/kg		3.26E+00	NoA
81	1	2-Butanone	1.30E-02	mg/kg		5.78E+02	NoA
81	1	2-Chloronaphthalene	4.20E-01	mg/kg		6.26E+02	NoA
81	1	2-Chlorophenol	4.20E-01	mg/kg		3.91E+01	NoA
81	1	2-Hexanone	1.30E-02	mg/kg		4.05E+00	NoA
81	1	2-Methyl-4,6-dinitrophenol	2.10E+00	mg/kg		2.61E-01	Yes
81	1	2-Methylnaphthalene	4.20E-01	mg/kg		1.30E+01	NoA
81	1	2-Methylphenol	4.20E-01	mg/kg		1.54E+02	NoA
81	1	2-Nitrobenzenamine	2.10E+00	mg/kg		2.96E-01	Yes
81	1	2-Nitrophenol	4.20E-01	mg/kg			NoC
81	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
81	1	3-Nitrobenzenamine	2.10E+00	mg/kg		9.78E-01	Yes
81	1	4-Bromophenyl phenyl ether	4.20E-01	mg/kg			NoC
81	1	4-Chloro-3-methylphenol	4.20E-01	mg/kg			NoC
81	1	4-Chlorobenzenamine	4.20E-01	mg/kg		8.66E-01	NoA
81	1	4-Chlorophenyl phenyl ether	4.20E-01	mg/kg			NoC
81	1	4-Methyl-2-pentanone	1.30E-02	mg/kg		1.13E+02	NoA
81	1	4-Nitrophenol	2.10E+00	mg/kg			NoC
81	1	Acenaphthene	4.20E-01	mg/kg		1.17E+02	NoA
81	1	Acenaphthylene	4.20E-01	mg/kg			NoC
81	1	Acetone	1.30E-02	mg/kg		1.34E+03	NoA
81	1	Anthracene	4.20E-01	mg/kg		7.47E+02	NoA
81	1	Antimony	1.31E+01	mg/kg	2.10E-01	5.52E-01	Yes
81	1	Benzene	6.00E-03	mg/kg		3.33E-01	NoA
81	1	Benzenemethanol	4.20E-01	mg/kg		3.26E+02	NoA
81	1	Benzo(ghi)perylene	4.20E-01	mg/kg			NoC
81	1	Benzoic acid	2.10E+00	mg/kg		1.30E+04	NoA
81	1	Bis(2-chloroethoxy)methane	4.20E-01	mg/kg		9.78E+00	NoA
81	1	Bis(2-chloroethyl) ether	4.20E-01	mg/kg		2.14E-01	Yes
81	1	Bis(2-chloroisopropyl) ether	4.20E-01	mg/kg		4.57E+00	NoA
81	1	Bis(2-ethylhexyl)phthalate	5.90E-01	mg/kg		1.25E+01	NoA
81	1	Bromodichloromethane	6.00E-03	mg/kg		2.73E-01	NoA
81	1	Bromoform	6.00E-03	mg/kg		2.19E+01	NoA
81	1	Bromomethane	1.30E-02	mg/kg		1.34E-01	NoA
81	1	Butyl benzyl phthalate	4.20E-01	mg/kg		9.18E+01	NoA
81	1	Carbon disulfide	6.00E-03	mg/kg		1.48E+01	NoA
81	1	Carbon tetrachloride	6.00E-03	mg/kg		2.39E-01	NoA
81	1	Chlorobenzene	6.00E-03	mg/kg		4.07E+00	NoA
81	1	Chloroethane	1.30E-02	mg/kg		1.45E+03	NoA
81	1	Chloroform	6.00E-03	mg/kg		1.22E-01	NoA
81	1	Chloromethane	1.30E-02	mg/kg		1.65E+00	NoA
81	1	cis-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
81	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
81	1	Dibenzofuran	4.20E-01	mg/kg		3.26E+00	NoA
81	1	Dibromochloromethane	6.00E-03	mg/kg		2.42E-01	NoA
81	1	Diethyl phthalate	4.20E-01	mg/kg		2.61E+03	NoA
81	1	Dimethyl phthalate	4.20E-01	mg/kg			NoC
81	1	Di-n-butyl phthalate	4.20E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
81	1	Di-n-octylphthalate	4.20E-01	mg/kg		1.30E+02	NoA
81	1	Ethylbenzene	6.00E-03	mg/kg		1.58E+00	NoA
81	1	Fluoranthene	4.20E-01	mg/kg		1.09E+02	NoA
81	1	Fluorene	4.20E-01	mg/kg		9.15E+01	NoA
81	1	Hexachlorobenzene	4.20E-01	mg/kg		4.92E-02	Yes
81	1	Hexachlorobutadiene	4.20E-01	mg/kg		2.22E+00	NoA
81	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
81	1	Hexachloroethane	4.20E-01	mg/kg		2.28E+00	NoA
81	1	Isophorone	4.20E-01	mg/kg		1.82E+02	NoA
81	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
81	1	m,p-Cresol	7.10E-01	mg/kg		3.91E+01	NoA
81	1	Magnesium	1.80E+03	mg/kg	7.70E+03		NoBE
81	1	Manganese	7.14E+02	mg/kg	1.50E+03	4.19E+02	NoB
81	1	Methylene chloride	6.00E-03	mg/kg		3.65E+00	NoA
81	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
81	1	Naphthalene	4.20E-01	mg/kg		1.15E+00	NoA
81	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
81	1	N-Nitroso-di-n-propylamine	4.20E-01	mg/kg		1.89E-02	Yes
81	1	N-Nitrosodiphenylamine	4.20E-01	mg/kg		3.22E+01	NoA
81	1	Pentachlorophenol	2.10E+00	mg/kg		4.36E-01	Yes
81	1	Phenanthrene	4.20E-01	mg/kg			NoC
81	1	Phenol	4.20E-01	mg/kg		4.98E+02	NoA
81	1	p-Nitroaniline	2.10E+00	mg/kg		8.66E+00	NoA
81	1	Pyrene	4.20E-01	mg/kg		8.12E+01	NoA
81	1	Pyridine	7.10E-01	mg/kg		7.82E+00	NoA
81	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
81	1	Sodium	1.11E+02	mg/kg	3.20E+02		NoBE
81	1	Styrene	6.00E-03	mg/kg		9.43E+01	NoA
81	1	Tetrachloroethene	6.00E-03	mg/kg		1.13E-01	NoA
81	1	Thallium	8.00E-01	mg/kg	2.10E-01	3.68E-01	Yes
81	1	Toluene	6.00E-03	mg/kg		9.61E+01	NoA
81	1	Total Xylene	6.00E-03	mg/kg		7.96E+00	NoA
81	1	trans-1,3-Dichloropropene	6.00E-03	mg/kg			NoC
81	1	Trichloroethene	6.00E-03	mg/kg		2.34E-02	NoA
81	1	Vanadium	2.74E+01	mg/kg	3.80E+01	3.65E-02	NoB
81	1	Vinyl acetate	1.30E-02	mg/kg		1.83E+01	NoA
81	1	Vinyl chloride	1.30E-02	mg/kg		8.24E-02	NoA
81	1	Zinc	4.99E+01	mg/kg	6.50E+01	1.38E+03	NoAB
153	1	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
153	1	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
153	1	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
153	1	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
153	1	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
153	1	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
153	1	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
153	1	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
153	1	2,4-Dinitrophenol	1.90E+00	mg/kg		6.52E+00	NoA
153	1	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
153	1	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
153	1	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
153	1	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
153	1	2-Methyl-4,6-dinitrophenol	1.90E+00	mg/kg		2.61E-01	Yes
153	1	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
153	1	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
153	1	2-Nitrobenzenamine	1.90E+00	mg/kg		2.96E-01	Yes
153	1	2-Nitrophenol	3.80E-01	mg/kg			NoC
153	1	3,3'-Dichlorobenzidine	1.90E+00	mg/kg		3.85E-01	Yes
153	1	3-Nitrobenzenamine	1.90E+00	mg/kg		9.78E-01	Yes
153	1	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
153	1	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
153	1	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
153	1	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
153	1	4-Nitrophenol	1.90E+00	mg/kg			NoC
153	1	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
153	1	Acenaphthylene	3.80E-01	mg/kg			NoC
153	1	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
153	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
153	1	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
153	1	Benzo(ghi)perylene	3.80E-01	mg/kg			NoC
153	1	Benzoic acid	1.90E+00	mg/kg		1.30E+04	NoA
153	1	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
153	1	Bis(2-chloroethyl) ether	7.70E-03	mg/kg		2.14E-01	NoA
153	1	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
153	1	Bis(2-ethylhexyl)phthalate	3.80E-01	mg/kg		1.25E+01	NoA
153	1	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
153	1	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
153	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
153	1	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
153	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
153	1	Dimethyl phthalate	3.80E-01	mg/kg			NoC
153	1	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
153	1	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
153	1	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
153	1	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
153	1	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA
153	1	Hexachlorocyclopentadiene	1.90E+00	mg/kg		1.95E+01	NoA
153	1	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
153	1	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
153	1	m,p-Cresol	7.70E-01	mg/kg		3.91E+01	NoA
153	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
153	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
153	1	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
153	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
153	1	Nitrobenzene	1.90E+00	mg/kg		4.79E+00	NoA
153	1	N-Nitroso-di-n-propylamine	7.70E-03	mg/kg		1.89E-02	NoA
153	1	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
153	1	Pentachlorophenol	1.90E+00	mg/kg		4.36E-01	Yes
153	1	Phenol	3.80E-01	mg/kg		4.98E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
153	1	p-Nitroaniline	1.90E+00	mg/kg		8.66E+00	NoA
153	1	Pyridine	7.70E-01	mg/kg		7.82E+00	NoA
153	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
153	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
153	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
156	1	1,2,4-Trichlorobenzene	3.80E-01	mg/kg		7.86E-01	NoA
156	1	1,2-Dichlorobenzene	3.80E-01	mg/kg		2.92E+01	NoA
156	1	1,3-Dichlorobenzene	3.80E-01	mg/kg			NoC
156	1	1,4-Dichlorobenzene	3.80E-01	mg/kg		8.13E-01	NoA
156	1	2,4,5-Trichlorophenol	3.80E-01	mg/kg		3.26E+02	NoA
156	1	2,4,6-Trichlorophenol	3.80E-01	mg/kg		3.26E+00	NoA
156	1	2,4-Dichlorophenol	3.80E-01	mg/kg		9.78E+00	NoA
156	1	2,4-Dimethylphenol	3.80E-01	mg/kg		6.52E+01	NoA
156	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
156	1	2,4-Dinitrotoluene	3.80E-01	mg/kg		5.63E-01	NoA
156	1	2,6-Dinitrotoluene	3.80E-01	mg/kg		3.26E+00	NoA
156	1	2-Chloronaphthalene	3.80E-01	mg/kg		6.26E+02	NoA
156	1	2-Chlorophenol	3.80E-01	mg/kg		3.91E+01	NoA
156	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
156	1	2-Methylnaphthalene	3.80E-01	mg/kg		1.30E+01	NoA
156	1	2-Methylphenol	3.80E-01	mg/kg		1.54E+02	NoA
156	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
156	1	2-Nitrophenol	3.80E-01	mg/kg			NoC
156	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
156	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
156	1	4-Bromophenyl phenyl ether	3.80E-01	mg/kg			NoC
156	1	4-Chloro-3-methylphenol	3.80E-01	mg/kg			NoC
156	1	4-Chlorobenzenamine	3.80E-01	mg/kg		8.66E-01	NoA
156	1	4-Chlorophenyl phenyl ether	3.80E-01	mg/kg			NoC
156	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
156	1	Acenaphthene	3.80E-01	mg/kg		1.17E+02	NoA
156	1	Acenaphthylene	3.80E-01	mg/kg			NoC
156	1	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
156	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
156	1	Benzenemethanol	3.80E-01	mg/kg		3.26E+02	NoA
156	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
156	1	Bis(2-chloroethoxy)methane	3.80E-01	mg/kg		9.78E+00	NoA
156	1	Bis(2-chloroethyl) ether	7.50E-03	mg/kg		2.14E-01	NoA
156	1	Bis(2-chloroisopropyl) ether	3.80E-01	mg/kg		4.57E+00	NoA
156	1	Butyl benzyl phthalate	3.80E-01	mg/kg		9.18E+01	NoA
156	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
156	1	Dibenzofuran	3.80E-01	mg/kg		3.26E+00	NoA
156	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
156	1	Dimethyl phthalate	3.80E-01	mg/kg			NoC
156	1	Di-n-butyl phthalate	3.80E-01	mg/kg		3.26E+02	NoA
156	1	Di-n-octylphthalate	3.80E-01	mg/kg		1.30E+02	NoA
156	1	Fluorene	3.80E-01	mg/kg		9.15E+01	NoA
156	1	Hexachlorobenzene	3.80E-01	mg/kg		4.92E-02	Yes
156	1	Hexachlorobutadiene	3.80E-01	mg/kg		2.22E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
156	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
156	1	Hexachloroethane	3.80E-01	mg/kg		2.28E+00	NoA
156	1	Isophorone	3.80E-01	mg/kg		1.82E+02	NoA
156	1	m,p-Cresol	7.50E-01	mg/kg		3.91E+01	NoA
156	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
156	1	Naphthalene	3.80E-01	mg/kg		1.15E+00	NoA
156	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
156	1	N-Nitroso-di-n-propylamine	7.50E-03	mg/kg		1.89E-02	NoA
156	1	N-Nitrosodiphenylamine	3.80E-01	mg/kg		3.22E+01	NoA
156	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
156	1	Phenol	3.80E-01	mg/kg		4.98E+02	NoA
156	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
156	1	Pyridine	7.50E-01	mg/kg		7.82E+00	NoA
156	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
156	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
160	1	1,2,4-Trichlorobenzene	3.50E-01	mg/kg		7.86E-01	NoA
160	1	1,2-Dichlorobenzene	3.50E-01	mg/kg		2.92E+01	NoA
160	1	1,3-Dichlorobenzene	3.50E-01	mg/kg			NoC
160	1	1,4-Dichlorobenzene	3.50E-01	mg/kg		8.13E-01	NoA
160	1	2,4,5-Trichlorophenol	3.50E-01	mg/kg		3.26E+02	NoA
160	1	2,4,6-Trichlorophenol	3.50E-01	mg/kg		3.26E+00	NoA
160	1	2,4-Dichlorophenol	3.50E-01	mg/kg		9.78E+00	NoA
160	1	2,4-Dimethylphenol	3.50E-01	mg/kg		6.52E+01	NoA
160	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA
160	1	2,4-Dinitrotoluene	3.50E-01	mg/kg		5.63E-01	NoA
160	1	2,6-Dinitrotoluene	3.50E-01	mg/kg		3.26E+00	NoA
160	1	2-Chloronaphthalene	3.50E-01	mg/kg		6.26E+02	NoA
160	1	2-Chlorophenol	3.50E-01	mg/kg		3.91E+01	NoA
160	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
160	1	2-Methylnaphthalene	3.50E-01	mg/kg		1.30E+01	NoA
160	1	2-Methylphenol	3.50E-01	mg/kg		1.54E+02	NoA
160	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
160	1	2-Nitrophenol	3.50E-01	mg/kg			NoC
160	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
160	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
160	1	4-Bromophenyl phenyl ether	3.50E-01	mg/kg			NoC
160	1	4-Chloro-3-methylphenol	3.50E-01	mg/kg			NoC
160	1	4-Chlorobenzenamine	3.50E-01	mg/kg		8.66E-01	NoA
160	1	4-Chlorophenyl phenyl ether	3.50E-01	mg/kg			NoC
160	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
160	1	Acenaphthene	3.50E-01	mg/kg		1.17E+02	NoA
160	1	Acenaphthylene	3.50E-01	mg/kg			NoC
160	1	Anthracene	3.50E-01	mg/kg		7.47E+02	NoA
160	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
160	1	Benzenemethanol	3.50E-01	mg/kg		3.26E+02	NoA
160	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
160	1	Bis(2-chloroethoxy)methane	3.50E-01	mg/kg		9.78E+00	NoA
160	1	Bis(2-chloroethyl) ether	7.00E-03	mg/kg		2.14E-01	NoA
160	1	Bis(2-chloroisopropyl) ether	3.50E-01	mg/kg		4.57E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
160	1	Bis(2-ethylhexyl)phthalate	3.50E-01	mg/kg		1.25E+01	NoA
160	1	Butyl benzyl phthalate	3.50E-01	mg/kg		9.18E+01	NoA
160	1	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
160	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
160	1	Dibenzofuran	3.50E-01	mg/kg		3.26E+00	NoA
160	1	Diethyl phthalate	3.50E-01	mg/kg		2.61E+03	NoA
160	1	Dimethyl phthalate	3.50E-01	mg/kg			NoC
160	1	Di-n-butyl phthalate	3.50E-01	mg/kg		3.26E+02	NoA
160	1	Di-n-octylphthalate	3.50E-01	mg/kg		1.30E+02	NoA
160	1	Fluorene	3.50E-01	mg/kg		9.15E+01	NoA
160	1	Hexachlorobenzene	3.50E-01	mg/kg		4.92E-02	Yes
160	1	Hexachlorobutadiene	3.50E-01	mg/kg		2.22E+00	NoA
160	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
160	1	Hexachloroethane	3.50E-01	mg/kg		2.28E+00	NoA
160	1	Isophorone	3.50E-01	mg/kg		1.82E+02	NoA
160	1	m,p-Cresol	7.00E-01	mg/kg		3.91E+01	NoA
160	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
160	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
160	1	Naphthalene	3.50E-01	mg/kg		1.15E+00	NoA
160	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
160	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
160	1	N-Nitroso-di-n-propylamine	7.00E-03	mg/kg		1.89E-02	NoA
160	1	N-Nitrosodiphenylamine	3.50E-01	mg/kg		3.22E+01	NoA
160	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
160	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
160	1	Phenanthrene	3.50E-01	mg/kg			NoC
160	1	Phenol	3.50E-01	mg/kg		4.98E+02	NoA
160	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
160	1	Pyridine	7.00E-01	mg/kg		7.82E+00	NoA
160	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
160	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
160	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
163	1	1,1,1-Trichloroethane	1.00E-02	mg/kg		1.46E+02	NoA
163	1	1,1,2,2-Tetrachloroethane	1.00E-02	mg/kg		5.62E-01	NoA
163	1	1,1,2-Trichloroethane	1.00E-02	mg/kg		2.30E-02	NoA
163	1	1,1-Dichloroethane	1.00E-02	mg/kg		1.34E+00	NoA
163	1	1,1-Dichloroethene	1.68E-01	mg/kg		2.37E-02	Yes
163	1	1,2,4-Trichlorobenzene	5.00E-01	mg/kg		7.86E-01	NoA
163	1	1,2-Dichlorobenzene	5.00E-01	mg/kg		2.92E+01	NoA
163	1	1,2-Dichloroethane	1.00E-02	mg/kg		1.55E-01	NoA
163	1	1,2-Dichloropropane	1.00E-02	mg/kg		9.40E-01	NoA
163	1	1,2-Dimethylbenzene	1.00E-02	mg/kg		5.35E+01	NoA
163	1	1,3-Dichlorobenzene	5.00E-01	mg/kg			NoC
163	1	1,4-Dichlorobenzene	5.00E-01	mg/kg		8.13E-01	NoA
163	1	2,4,5-Trichlorophenol	5.00E-01	mg/kg		3.26E+02	NoA
163	1	2,4,6-Trichlorophenol	5.00E-01	mg/kg		3.26E+00	NoA
163	1	2,4-Dichlorophenol	5.00E-01	mg/kg		9.78E+00	NoA
163	1	2,4-Dimethylphenol	5.00E-01	mg/kg		6.52E+01	NoA
163	1	2,4-Dinitrophenol	1.70E+00	mg/kg		6.52E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
163	1	2,4-Dinitrotoluene	5.00E-01	mg/kg		5.63E-01	NoA
163	1	2,6-Dinitrotoluene	5.00E-01	mg/kg		3.26E+00	NoA
163	1	2-Chloronaphthalene	5.00E-01	mg/kg		6.26E+02	NoA
163	1	2-Chlorophenol	5.00E-01	mg/kg		3.91E+01	NoA
163	1	2-Hexanone	1.00E-02	mg/kg		4.05E+00	NoA
163	1	2-Methyl-4,6-dinitrophenol	1.70E+00	mg/kg		2.61E-01	Yes
163	1	2-Methylnaphthalene	5.00E-01	mg/kg		1.30E+01	NoA
163	1	2-Methylphenol	5.00E-01	mg/kg		1.54E+02	NoA
163	1	2-Nitrobenzenamine	1.70E+00	mg/kg		2.96E-01	Yes
163	1	2-Nitrophenol	5.00E-01	mg/kg			NoC
163	1	3,3'-Dichlorobenzidine	1.70E+00	mg/kg		3.85E-01	Yes
163	1	3-Nitrobenzenamine	1.70E+00	mg/kg		9.78E-01	Yes
163	1	4-Bromophenyl phenyl ether	5.00E-01	mg/kg			NoC
163	1	4-Chloro-3-methylphenol	5.00E-01	mg/kg			NoC
163	1	4-Chlorobenzenamine	5.00E-01	mg/kg		8.66E-01	NoA
163	1	4-Chlorophenyl phenyl ether	5.00E-01	mg/kg			NoC
163	1	4-Methyl-2-pentanone	1.00E-02	mg/kg		1.13E+02	NoA
163	1	4-Nitrophenol	1.70E+00	mg/kg			NoC
163	1	Acenaphthene	5.00E-01	mg/kg		1.17E+02	NoA
163	1	Acenaphthylene	5.00E-01	mg/kg			NoC
163	1	Anthracene	3.80E-01	mg/kg		7.47E+02	NoA
163	1	Antimony	2.00E+01	mg/kg	2.10E-01	5.52E-01	Yes
163	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
163	1	Benzene	1.00E-02	mg/kg		3.33E-01	NoA
163	1	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
163	1	Benzo(ghi)perylene	3.80E-01	mg/kg			NoC
163	1	Benzoic acid	1.70E+00	mg/kg		1.30E+04	NoA
163	1	Beryllium	5.00E-01	mg/kg	6.70E-01	5.67E-03	NoB
163	1	Bis(2-chloroethoxy)methane	5.00E-01	mg/kg		9.78E+00	NoA
163	1	Bis(2-chloroethyl) ether	5.00E-01	mg/kg		2.14E-01	Yes
163	1	Bis(2-chloroisopropyl) ether	5.00E-01	mg/kg		4.57E+00	NoA
163	1	Bis(2-ethylhexyl)phthalate	5.00E-01	mg/kg		1.25E+01	NoA
163	1	Boron	1.00E+02	mg/kg		9.18E+02	NoA
163	1	Bromodichloromethane	1.00E-02	mg/kg		2.73E-01	NoA
163	1	Bromoform	1.00E-02	mg/kg		2.19E+01	NoA
163	1	Bromomethane	1.00E-02	mg/kg		1.34E-01	NoA
163	1	Butyl benzyl phthalate	5.00E-01	mg/kg		9.18E+01	NoA
163	1	Cadmium	2.00E+00	mg/kg	2.10E-01	8.11E-01	Yes
163	1	Carbazole	5.00E-01	mg/kg		8.72E+00	NoA
163	1	Carbon disulfide	1.00E-02	mg/kg		1.48E+01	NoA
163	1	Carbon tetrachloride	1.00E-02	mg/kg		2.39E-01	NoA
163	1	Chlorobenzene	1.00E-02	mg/kg		4.07E+00	NoA
163	1	Chloroethane	1.00E-02	mg/kg		1.45E+03	NoA
163	1	Chloroform	1.00E-02	mg/kg		1.22E-01	NoA
163	1	Chloromethane	1.00E-02	mg/kg		1.65E+00	NoA
163	1	cis-1,2-Dichloroethene	1.68E-01	mg/kg		1.05E+00	NoA
163	1	cis-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
163	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
163	1	Dibenzofuran	5.00E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
163	1	Dibromochloromethane	1.00E-02	mg/kg		2.42E-01	NoA
163	1	Diethyl phthalate	3.80E-01	mg/kg		2.61E+03	NoA
163	1	Dimethyl phthalate	5.00E-01	mg/kg			NoC
163	1	Di-n-butyl phthalate	6.60E-01	mg/kg		3.26E+02	NoA
163	1	Di-n-octylphthalate	5.00E-01	mg/kg		1.30E+02	NoA
163	1	Ethylbenzene	1.00E-02	mg/kg		1.58E+00	NoA
163	1	Fluoranthene	3.80E-01	mg/kg		1.09E+02	NoA
163	1	Fluorene	5.00E-01	mg/kg		9.15E+01	NoA
163	1	Hexachlorobenzene	5.00E-01	mg/kg		4.92E-02	Yes
163	1	Hexachlorobutadiene	5.00E-01	mg/kg		2.22E+00	NoA
163	1	Hexachlorocyclopentadiene	1.70E+00	mg/kg		1.95E+01	NoA
163	1	Hexachloroethane	5.00E-01	mg/kg		2.28E+00	NoA
163	1	Isophorone	5.00E-01	mg/kg		1.82E+02	NoA
163	1	Lead	2.00E+01	mg/kg	3.60E+01	4.00E+02	NoAB
163	1	m,p-Cresol	7.10E-01	mg/kg		3.91E+01	NoA
163	1	m,p-Xylene	2.00E-02	mg/kg		7.96E+00	NoA
163	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
163	1	Methylene chloride	1.00E-02	mg/kg		3.65E+00	NoA
163	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
163	1	Naphthalene	5.00E-01	mg/kg		1.15E+00	NoA
163	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
163	1	Nitrobenzene	1.70E+00	mg/kg		4.79E+00	NoA
163	1	N-Nitroso-di-n-propylamine	5.00E-01	mg/kg		1.89E-02	Yes
163	1	N-Nitrosodiphenylamine	5.00E-01	mg/kg		3.22E+01	NoA
163	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
163	1	Pentachlorophenol	1.70E+00	mg/kg		4.36E-01	Yes
163	1	Phenanthrene	5.00E-01	mg/kg			NoC
163	1	Phenol	5.00E-01	mg/kg		4.98E+02	NoA
163	1	p-Nitroaniline	1.70E+00	mg/kg		8.66E+00	NoA
163	1	Pyrene	3.60E-01	mg/kg		8.12E+01	NoA
163	1	Pyridine	7.10E-01	mg/kg		7.82E+00	NoA
163	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
163	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
163	1	Sodium	2.00E+02	mg/kg	3.20E+02		NoBE
163	1	Styrene	1.00E-02	mg/kg		9.43E+01	NoA
163	1	Tetrachloroethene	1.00E-02	mg/kg		1.13E-01	NoA
163	1	Thallium	1.50E+01	mg/kg	2.10E-01	3.68E-01	Yes
163	1	Toluene	1.00E-02	mg/kg		9.61E+01	NoA
163	1	trans-1,2-Dichloroethene	1.68E-01	mg/kg		2.43E+00	NoA
163	1	trans-1,3-Dichloropropene	1.00E-02	mg/kg			NoC
163	1	Trichloroethene	1.68E-01	mg/kg		2.34E-02	Yes
163	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
163	1	Vinyl chloride	1.68E-01	mg/kg		8.24E-02	Yes
219	1	1,2,4-Trichlorobenzene	3.60E-01	mg/kg		7.86E-01	NoA
219	1	1,2-Dichlorobenzene	3.60E-01	mg/kg		2.92E+01	NoA
219	1	1,3-Dichlorobenzene	3.60E-01	mg/kg			NoC
219	1	1,4-Dichlorobenzene	3.60E-01	mg/kg		8.13E-01	NoA
219	1	2,4,5-Trichlorophenol	3.60E-01	mg/kg		3.26E+02	NoA
219	1	2,4,6-Trichlorophenol	3.60E-01	mg/kg		3.26E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
219	1	2,4-Dichlorophenol	3.60E-01	mg/kg		9.78E+00	NoA
219	1	2,4-Dimethylphenol	3.60E-01	mg/kg		6.52E+01	NoA
219	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
219	1	2,4-Dinitrotoluene	3.60E-01	mg/kg		5.63E-01	NoA
219	1	2,6-Dinitrotoluene	3.60E-01	mg/kg		3.26E+00	NoA
219	1	2-Chloronaphthalene	3.60E-01	mg/kg		6.26E+02	NoA
219	1	2-Chlorophenol	3.60E-01	mg/kg		3.91E+01	NoA
219	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
219	1	2-Methylnaphthalene	3.60E-01	mg/kg		1.30E+01	NoA
219	1	2-Methylphenol	3.60E-01	mg/kg		1.54E+02	NoA
219	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
219	1	2-Nitrophenol	3.60E-01	mg/kg			NoC
219	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
219	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
219	1	4-Bromophenyl phenyl ether	3.60E-01	mg/kg			NoC
219	1	4-Chloro-3-methylphenol	3.60E-01	mg/kg			NoC
219	1	4-Chlorobenzenamine	3.60E-01	mg/kg		8.66E-01	NoA
219	1	4-Chlorophenyl phenyl ether	3.60E-01	mg/kg			NoC
219	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
219	1	Acenaphthene	3.60E-01	mg/kg		1.17E+02	NoA
219	1	Acenaphthylene	3.60E-01	mg/kg			NoC
219	1	Anthracene	3.60E-01	mg/kg		7.47E+02	NoA
219	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
219	1	Benzenemethanol	3.60E-01	mg/kg		3.26E+02	NoA
219	1	Benzo(ghi)perylene	3.60E-01	mg/kg			NoC
219	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
219	1	Bis(2-chloroethoxy)methane	3.60E-01	mg/kg		9.78E+00	NoA
219	1	Bis(2-chloroethyl) ether	7.30E-03	mg/kg		2.14E-01	NoA
219	1	Bis(2-chloroisopropyl) ether	3.60E-01	mg/kg		4.57E+00	NoA
219	1	Bis(2-ethylhexyl)phthalate	3.60E-01	mg/kg		1.25E+01	NoA
219	1	Butyl benzyl phthalate	3.60E-01	mg/kg		9.18E+01	NoA
219	1	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
219	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
219	1	Dibenzofuran	3.60E-01	mg/kg		3.26E+00	NoA
219	1	Diethyl phthalate	3.60E-01	mg/kg		2.61E+03	NoA
219	1	Dimethyl phthalate	3.60E-01	mg/kg			NoC
219	1	Di-n-butyl phthalate	3.60E-01	mg/kg		3.26E+02	NoA
219	1	Di-n-octylphthalate	3.60E-01	mg/kg		1.30E+02	NoA
219	1	Fluorene	3.60E-01	mg/kg		9.15E+01	NoA
219	1	Hexachlorobenzene	3.60E-01	mg/kg		4.92E-02	Yes
219	1	Hexachlorobutadiene	3.60E-01	mg/kg		2.22E+00	NoA
219	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
219	1	Hexachloroethane	3.60E-01	mg/kg		2.28E+00	NoA
219	1	Isophorone	3.60E-01	mg/kg		1.82E+02	NoA
219	1	m,p-Cresol	7.30E-01	mg/kg		3.91E+01	NoA
219	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
219	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
219	1	Naphthalene	3.60E-01	mg/kg		1.15E+00	NoA
219	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
219	1	N-Nitroso-di-n-propylamine	7.30E-03	mg/kg		1.89E-02	NoA
219	1	N-Nitrosodiphenylamine	3.60E-01	mg/kg		3.22E+01	NoA
219	1	PCB, Total	5.00E+00	mg/kg		6.48E-02	Yes
219	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
219	1	Phenol	3.60E-01	mg/kg		4.98E+02	NoA
219	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
219	1	Pyridine	7.30E-01	mg/kg		7.82E+00	NoA
219	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
219	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes
219	1	Uranium	2.00E+01	mg/kg	4.90E+00	1.38E+01	Yes
488	1	1,2,4-Trichlorobenzene	3.70E-01	mg/kg		7.86E-01	NoA
488	1	1,2-Dichlorobenzene	3.70E-01	mg/kg		2.92E+01	NoA
488	1	1,3-Dichlorobenzene	3.70E-01	mg/kg			NoC
488	1	1,4-Dichlorobenzene	3.70E-01	mg/kg		8.13E-01	NoA
488	1	2,4,5-Trichlorophenol	3.70E-01	mg/kg		3.26E+02	NoA
488	1	2,4,6-Trichlorophenol	3.70E-01	mg/kg		3.26E+00	NoA
488	1	2,4-Dichlorophenol	3.70E-01	mg/kg		9.78E+00	NoA
488	1	2,4-Dimethylphenol	3.70E-01	mg/kg		6.52E+01	NoA
488	1	2,4-Dinitrophenol	1.80E+00	mg/kg		6.52E+00	NoA
488	1	2,4-Dinitrotoluene	3.70E-01	mg/kg		5.63E-01	NoA
488	1	2,6-Dinitrotoluene	3.70E-01	mg/kg		3.26E+00	NoA
488	1	2-Chloronaphthalene	3.70E-01	mg/kg		6.26E+02	NoA
488	1	2-Chlorophenol	3.70E-01	mg/kg		3.91E+01	NoA
488	1	2-Methyl-4,6-dinitrophenol	1.80E+00	mg/kg		2.61E-01	Yes
488	1	2-Methylnaphthalene	3.70E-01	mg/kg		1.30E+01	NoA
488	1	2-Methylphenol	3.70E-01	mg/kg		1.54E+02	NoA
488	1	2-Nitrobenzenamine	1.80E+00	mg/kg		2.96E-01	Yes
488	1	2-Nitrophenol	3.70E-01	mg/kg			NoC
488	1	3,3'-Dichlorobenzidine	1.80E+00	mg/kg		3.85E-01	Yes
488	1	3-Nitrobenzenamine	1.80E+00	mg/kg		9.78E-01	Yes
488	1	4-Bromophenyl phenyl ether	3.70E-01	mg/kg			NoC
488	1	4-Chloro-3-methylphenol	3.70E-01	mg/kg			NoC
488	1	4-Chlorobenzenamine	3.70E-01	mg/kg		8.66E-01	NoA
488	1	4-Chlorophenyl phenyl ether	3.70E-01	mg/kg			NoC
488	1	4-Nitrophenol	1.80E+00	mg/kg			NoC
488	1	Acenaphthylene	3.70E-01	mg/kg			NoC
488	1	Arsenic	1.10E+01	mg/kg	1.20E+01	2.38E-01	NoB
488	1	Benzenemethanol	3.70E-01	mg/kg		3.26E+02	NoA
488	1	Benzoic acid	1.80E+00	mg/kg		1.30E+04	NoA
488	1	Bis(2-chloroethoxy)methane	3.70E-01	mg/kg		9.78E+00	NoA
488	1	Bis(2-chloroethyl) ether	7.40E-03	mg/kg		2.14E-01	NoA
488	1	Bis(2-chloroisopropyl) ether	3.70E-01	mg/kg		4.57E+00	NoA
488	1	Butyl benzyl phthalate	3.70E-01	mg/kg		9.18E+01	NoA
488	1	Chromium	8.50E+01	mg/kg	1.60E+01	1.56E+01	Yes
488	1	Copper	3.50E+01	mg/kg	1.90E+01	1.84E+02	NoA
488	1	Dibenzofuran	3.70E-01	mg/kg		3.26E+00	NoA
488	1	Diethyl phthalate	3.70E-01	mg/kg		2.61E+03	NoA
488	1	Dimethyl phthalate	3.70E-01	mg/kg			NoC
488	1	Di-n-butyl phthalate	3.70E-01	mg/kg		3.26E+02	NoA

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.1. Surface Soil COPCs for Nondetected Analyses (Continued)

SWMU	EU	Chemical	Maximum Nondetect Concentration	Units	Surface Background Concentration	Child Resident NAL	COPC?
488	1	Di-n-octylphthalate	3.70E-01	mg/kg		1.30E+02	NoA
488	1	Fluorene	3.70E-01	mg/kg		9.15E+01	NoA
488	1	Hexachlorobenzene	3.70E-01	mg/kg		4.92E-02	Yes
488	1	Hexachlorobutadiene	3.70E-01	mg/kg		2.22E+00	NoA
488	1	Hexachlorocyclopentadiene	1.80E+00	mg/kg		1.95E+01	NoA
488	1	Hexachloroethane	3.70E-01	mg/kg		2.28E+00	NoA
488	1	Isophorone	3.70E-01	mg/kg		1.82E+02	NoA
488	1	Lead	1.30E+01	mg/kg	3.60E+01	4.00E+02	NoAB
488	1	m,p-Cresol	7.40E-01	mg/kg		3.91E+01	NoA
488	1	Mercury	1.00E+01	mg/kg	2.00E-01	2.13E-01	Yes
488	1	Molybdenum	1.50E+01	mg/kg		2.30E+01	NoA
488	1	Naphthalene	3.70E-01	mg/kg		1.15E+00	NoA
488	1	Nickel	6.50E+01	mg/kg	2.10E+01	1.04E+01	Yes
488	1	Nitrobenzene	1.80E+00	mg/kg		4.79E+00	NoA
488	1	N-Nitroso-di-n-propylamine	7.40E-03	mg/kg		1.89E-02	NoA
488	1	N-Nitrosodiphenylamine	3.70E-01	mg/kg		3.22E+01	NoA
488	1	Pentachlorophenol	1.80E+00	mg/kg		4.36E-01	Yes
488	1	Phenol	3.70E-01	mg/kg		4.98E+02	NoA
488	1	p-Nitroaniline	1.80E+00	mg/kg		8.66E+00	NoA
488	1	Pyridine	7.40E-01	mg/kg		7.82E+00	NoA
488	1	Selenium	2.00E+01	mg/kg	8.00E-01	2.30E+01	NoA
488	1	Silver	1.00E+01	mg/kg	2.30E+00	2.61E+00	Yes

A = <Child Resident NAL C = no NAL available
B = <Background E = essential nutrient

Table D7.2. Toxicity Values and Information Used in Soils OU Uncertainty Analysis

Chemical Abstract Number	Analyte	GI Absorption Factor (Unitless)	Oral RfD (RfDo)	Absorbed Dose (RfDd)	Inhalation (RfCi)	Inhalation (RfDi)	Oral Slope Factor (SFo)	Absorbed Dose Slope Factor (SFd)	Inhalation Slope Factor (SFi)	PEF Ind./ Comm.	RAGS Part E ABS (Unitless)	Perme-ability Constant
96184	1,2,3-Trichloropropane	1.00E+00	4.00E-03	4.00E-03	3.00E-04	8.57E-05	3.00E+01	3.00E+01		6.20E+08	0.00E+00	9.60E-03
120821	1,2,4-Trichlorobenzene	1.00E+00	1.00E-02	1.00E-02	2.00E-03	5.71E-04	2.90E-02	2.90E-02		6.20E+08	0.00E+00	7.05E-02
107062	1,2-Dichloroethane	1.00E+00	6.00E-03	6.00E-03	7.00E-03	2.00E-03	9.10E-02	9.10E-02	9.10E-05	6.20E+08	0.00E+00	
106467	1,4-Dichlorobenzene	1.00E+00	7.00E-02	7.00E-02	8.00E-01	2.29E-01	5.40E-03	5.40E-03	3.85E-05	6.20E+08	0.00E+00	
121142	2,4-Dinitrotoluene	1.00E+00	2.00E-03	2.00E-03			3.10E-01	3.10E-01	3.12E-04	6.20E+08	1.02E-01	
	2-Methyl-4,6-dinitrophenol	not available										
	2-Nitrobenzenamine	not available										
91941	3,3'-Dichlorobenzidine	1.00E+00					4.50E-01	4.50E-01	1.19E-03		1.00E-01	
	3-Nitrobenzenamine	not available										
	4-Chlorobenzenamine	not available										
111444	Bis(2-chloroethyl) ether	1.00E+00					1.10E+00	1.10E+00	1.16E-03		0.00E+00	
87683	Hexachlorobutadiene	1.00E+00	1.00E-03	1.00E-03			7.80E-02	7.80E-02	7.70E-05		1.00E-01	
67721	Hexachloroethane	1.00E+00	7.00E-04	7.00E-04	3.00E-02	8.57E-03	4.00E-02	4.00E-02	3.85E-05		1.00E-01	
621647	N-Nitroso-di-n-propylamine	1.00E+00					7.00E+00	7.00E+00	7.00E-03		1.00E-01	
110576	Trans-1,4-Dichloro-2-butene	1.00E+00							1.47E-02		1.00E-01	

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
5	1	1	Surface	3,3'-Dichlorobenzidine	mg/kg	8.90E-01	2.44E-08	2.29E-07	1.57E-11
5	1	1	Surface	Antimony	mg/kg	9.65E+00	2.64E-07	1.24E-06	1.71E-10
5	1	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.40E-01	1.21E-08	0.00E+00	7.78E-12
5	1	1	Surface	Hexachlorobenzene	mg/kg	4.40E-01	1.21E-08	1.13E-07	2.42E-07
5	1	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.40E-01	1.21E-08	1.13E-07	7.78E-12
5	1	1	Surface	Pentachlorophenol	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
5	1	1	Surface	Silver	mg/kg	3.20E+00	8.77E-08	3.30E-07	5.66E-11
5	1	1	Surface	Thallium	mg/kg	1.93E+01	5.29E-07	2.49E-06	3.41E-10
5	1	1	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
5	1	2	Surface	3,3'-Dichlorobenzidine	mg/kg	9.30E-01	2.55E-08	2.40E-07	1.64E-11
5	1	2	Surface	Bis(2-chloroethyl) ether	mg/kg	4.60E-01	1.26E-08	0.00E+00	8.13E-12
5	1	2	Surface	Hexachlorobenzene	mg/kg	4.60E-01	1.26E-08	1.18E-07	2.53E-07
5	1	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.60E-01	1.26E-08	1.18E-07	8.13E-12
5	1	2	Surface	Pentachlorophenol	mg/kg	2.30E+00	6.30E-08	5.92E-07	4.07E-11
5	1	2	Surface	Total PAH	mg/kg	4.60E-01	1.26E-08	1.54E-07	6.01E-10
5	1	3	Surface	1,4-Dichlorobenzene	mg/kg	2.30E+00	6.30E-08	0.00E+00	4.07E-11
5	1	3	Surface	Antimony	mg/kg	1.50E+01	4.11E-07	1.93E-06	2.65E-10
5	1	3	Surface	Bis(2-chloroethyl) ether	mg/kg	3.30E-01	9.04E-09	0.00E+00	5.83E-12
5	1	3	Surface	Cadmium	mg/kg	3.00E+00	8.22E-08	7.73E-09	5.30E-11
5	1	3	Surface	Hexachlorobenzene	mg/kg	2.30E+00	6.30E-08	5.92E-07	1.27E-06
5	1	3	Surface	Hexachlorobutadiene	mg/kg	2.30E+00	6.30E-08	5.92E-07	4.07E-11
5	1	3	Surface	Hexachloroethane	mg/kg	2.30E+00	6.30E-08	5.92E-07	4.07E-11
5	1	3	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.30E-01	9.04E-09	8.50E-08	5.83E-12
5	1	3	Surface	Pentachlorophenol	mg/kg	2.30E+00	6.30E-08	5.92E-07	4.07E-11
5	1	3	Surface	Silver	mg/kg	4.00E+00	1.10E-07	4.12E-07	7.07E-11
5	1	3	Surface	Thallium	mg/kg	2.50E+01	6.85E-07	3.22E-06	4.42E-10
5	1	3	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
5	1	4	Surface	3,3'-Dichlorobenzidine	mg/kg	7.80E-01	2.14E-08	2.01E-07	1.38E-11
5	1	4	Surface	Antimony	mg/kg	1.22E+01	3.34E-07	1.57E-06	2.16E-10
5	1	4	Surface	Bis(2-chloroethyl) ether	mg/kg	3.90E-01	1.07E-08	0.00E+00	6.89E-12
5	1	4	Surface	Cadmium	mg/kg	1.80E+00	4.93E-08	4.64E-09	3.18E-11
5	1	4	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
5	1	4	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.90E-01	1.07E-08	1.00E-07	6.89E-12
5	1	4	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	1	4	Surface	Thallium	mg/kg	1.80E+01	4.93E-07	2.32E-06	3.18E-10
5	1	4	Surface	Total PAH	mg/kg	4.80E-01	1.32E-08	1.61E-07	6.27E-10
5	1	5	Surface	3,3'-Dichlorobenzidine	mg/kg	8.20E-01	2.25E-08	2.11E-07	1.45E-11
5	1	5	Surface	Antimony	mg/kg	9.75E+00	2.67E-07	1.26E-06	1.72E-10
5	1	5	Surface	Bis(2-chloroethyl) ether	mg/kg	4.10E-01	1.12E-08	0.00E+00	7.25E-12
5	1	5	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	1	5	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.10E-01	1.12E-08	1.06E-07	7.25E-12
5	1	5	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
5	1	5	Surface	Thallium	mg/kg	1.95E+01	5.34E-07	2.51E-06	3.45E-10
5	99	1	Surface	Antimony	mg/kg	9.72E+00	2.66E-07	1.25E-06	1.72E-10
5	99	1	Surface	Cadmium	mg/kg	1.94E+00	5.32E-08	5.00E-09	3.43E-11
5	99	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	99	1	Surface	Thallium	mg/kg	1.94E+01	5.32E-07	2.50E-06	3.43E-10
5	99	1	Surface	Total PAH	mg/kg	4.80E-01	1.32E-08	1.61E-07	6.27E-10
5	99	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
5	194	1	Surface	Hexachlorobenzene	mg/kg	4.30E-01	1.18E-08	1.11E-07	2.37E-07
5	194	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
5	194	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	2	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
5	194	2	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	2	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	2	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	2	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	3	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	3	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	194	3	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	3	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	3	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	3	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	3	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	4	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	4	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	194	4	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	4	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	4	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	5	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	5	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	194	5	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	5	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	5	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	6	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	6	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
5	194	6	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	6	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	6	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	6	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	7	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	7	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
5	194	7	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	7	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	7	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	7	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	8	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	8	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
5	194	8	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	8	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	8	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	8	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	8	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	8	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	9	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	9	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
5	194	9	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
5	194	9	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	9	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	9	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	9	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	9	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	10	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	10	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
5	194	10	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	10	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	10	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	10	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	10	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	11	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	194	11	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
5	194	11	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	194	11	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	12	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	194	12	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
5	194	12	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	12	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	12	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	194	12	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	13	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	13	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
5	194	13	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	13	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	13	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	13	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	13	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	14	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	14	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
5	194	14	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	14	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	14	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	14	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	14	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	15	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	15	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	15	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	15	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	16	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	16	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	194	16	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	16	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	16	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	16	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	16	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	17	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	194	17	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
5	194	17	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
5	194	17	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	17	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	17	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	194	17	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	17	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	18	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	18	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
5	194	18	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	18	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	18	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	18	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	18	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	19	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
5	194	19	Surface	Hexachlorobenzene	mg/kg	4.40E-01	1.21E-08	1.13E-07	2.42E-07
5	194	19	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	19	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	19	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
5	194	19	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	19	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	20	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	20	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
5	194	20	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	20	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	20	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	21	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	21	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
5	194	21	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	21	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	21	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	21	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	22	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	22	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
5	194	22	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	22	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	22	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	22	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	22	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	23	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	23	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	194	23	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	23	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	23	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	23	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	24	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
5	194	24	Surface	Hexachlorobenzene	mg/kg	4.40E-01	1.21E-08	1.13E-07	2.42E-07
5	194	24	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	24	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	24	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
5	194	24	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	24	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
5	194	25	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	25	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
5	194	25	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	25	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	25	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	25	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	194	25	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	26	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	26	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
5	194	26	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	26	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
5	194	26	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	26	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	26	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	27	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	27	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
5	194	27	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	27	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	27	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	27	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	28	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	28	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
5	194	28	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	28	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	28	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
5	194	28	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	29	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
5	194	29	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
5	194	29	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	194	29	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	29	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
5	194	29	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	30	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	30	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
5	194	30	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	194	30	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
5	194	30	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	31	Surface	3,3'-Dichlorobenzidine	mg/kg	4.70E-01	1.29E-08	1.21E-07	8.31E-12
5	194	31	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	31	Surface	Bis(2-chloroethyl) ether	mg/kg	4.70E-01	1.29E-08	0.00E+00	8.31E-12
5	194	31	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
5	194	31	Surface	Hexachlorobenzene	mg/kg	4.70E-01	1.29E-08	1.21E-07	2.59E-07
5	194	31	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.70E-01	1.29E-08	1.21E-07	8.31E-12
5	194	31	Surface	PCB, Total	mg/kg	1.00E-01	2.74E-09	3.61E-08	2.98E-09
5	194	31	Surface	Pentachlorophenol	mg/kg	4.70E-01	1.29E-08	1.21E-07	8.31E-12
5	194	31	Surface	Silver	mg/kg	4.00E+00	1.10E-07	4.12E-07	7.07E-11
5	194	31	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	194	31	Surface	Total PAH	mg/kg	4.70E-01	1.29E-08	1.57E-07	6.14E-10
5	196	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
5	196	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
5	196	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	196	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	196	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
5	196	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	196	2	Surface	Benzene	mg/kg	1.00E+00	2.74E-08	6.44E-07	6.89E-06
5	196	2	Surface	Silver	mg/kg	3.00E+00	8.22E-08	3.09E-07	5.30E-11
5	489	1	Surface	1,2,3-Trichloropropane	mg/kg	5.70E-03	1.56E-10	0.00E+00	1.01E-13
5	489	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
5	489	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
5	489	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	489	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	489	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
5	489	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
5	489	1	Surface	Trans-1,4-Dichloro-2-butene	mg/kg	1.10E-02	3.01E-10	2.83E-09	1.94E-13
5	489	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
5	531	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	531	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
5	531	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
5	531	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
5	531	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
5	531	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	200	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	200	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
6	200	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	200	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	212	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	212	1	Surface	Antimony	mg/kg	9.74E+00	2.67E-07	1.25E-06	1.72E-10
6	212	1	Surface	Bis(2-chloroethyl) ether	mg/kg	3.30E-01	9.04E-09	0.00E+00	5.83E-12
6	212	1	Surface	Cadmium	mg/kg	1.95E+00	5.34E-08	5.02E-09	3.45E-11
6	212	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
6	212	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	212	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.30E-01	9.04E-09	8.50E-08	5.83E-12
6	212	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	212	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	212	1	Surface	Thallium	mg/kg	1.95E+01	5.34E-07	2.51E-06	3.45E-10
6	212	1	Surface	Total PAH	mg/kg	4.90E-01	1.34E-08	1.64E-07	6.40E-10
6	213	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	213	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
6	213	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	213	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	213	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	213	2	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	213	2	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
6	213	2	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	214	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	214	1	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
6	214	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
6	214	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	214	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
6	214	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
6	214	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	214	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	214	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	215	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	215	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
6	215	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	215	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
6	215	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	215	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	215	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	216	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	216	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
6	216	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	216	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
6	216	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
6	216	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	216	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	217	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	217	1	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
6	217	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	217	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
6	217	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	217	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	217	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	217	2	Surface	Bis(2-chloroethyl) ether	mg/kg	3.70E-01	1.01E-08	0.00E+00	6.54E-12
6	217	2	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
6	217	2	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
6	217	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.70E-01	1.01E-08	9.53E-08	6.54E-12
6	217	2	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
6	217	2	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
6	217	2	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	217	2	Surface	Uranium	mg/kg	2.00E+02	5.48E-06	2.58E-05	3.54E-09
6	221	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	221	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
6	221	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	221	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	221	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	222	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
6	222	1	Surface	Antimony	mg/kg	7.00E-01	1.92E-08	9.01E-08	1.24E-11
6	222	1	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
6	222	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	222	1	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
6	222	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	227	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	227	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	227	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	1.37E-08	0.00E+00	8.84E-12
6	227	1	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
6	227	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
6	227	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
6	227	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
6	227	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	227	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	227	1	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	227	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	227	2	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	227	2	Surface	Bis(2-chloroethyl) ether	mg/kg	4.80E-01	1.32E-08	0.00E+00	8.48E-12
6	227	2	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
6	227	2	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
6	227	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.80E-01	1.32E-08	1.24E-07	8.48E-12
6	227	2	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
6	227	2	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
6	227	2	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
6	228	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.60E+00	4.38E-08	4.12E-07	2.83E-11
6	228	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
6	228	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
6	228	1	Surface	Pentachlorophenol	mg/kg	1.60E+00	4.38E-08	4.12E-07	2.83E-11
7	76	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
7	76	1	Surface	Antimony	mg/kg	5.70E-01	1.56E-08	7.34E-08	1.01E-11
7	76	1	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
7	76	1	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
7	76	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
7	76	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
7	76	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
7	76	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
7	76	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
7	165	1	Surface	1,1-Dichloroethene	mg/kg	6.10E-01	1.67E-08	3.93E-07	9.77E-06
7	165	1	Surface	1,2-Dichloroethane	mg/kg	6.10E-01	1.67E-08	0.00E+00	1.08E-11
7	165	1	Surface	3,3'-Dichlorobenzidine	mg/kg	7.50E-01	2.05E-08	1.93E-07	1.33E-11
7	165	1	Surface	Benzene	mg/kg	6.10E-01	1.67E-08	3.93E-07	4.20E-06
7	165	1	Surface	Bis(2-chloroethyl) ether	mg/kg	3.70E-01	1.01E-08	0.00E+00	6.54E-12
7	165	1	Surface	Cadmium	mg/kg	5.00E+00	1.37E-07	1.29E-08	8.84E-11
7	165	1	Surface	Carbon tetrachloride	mg/kg	6.10E-01	1.67E-08	3.93E-07	7.80E-06
7	165	1	Surface	Chloroform	mg/kg	6.10E-01	1.67E-08	3.93E-07	4.77E-06
7	165	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
7	165	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.70E-01	1.01E-08	9.53E-08	6.54E-12
7	165	1	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
7	165	1	Surface	Tetrachloroethene	mg/kg	6.10E-01	1.67E-08	3.93E-07	5.71E-06
7	165	1	Surface	Thallium	mg/kg	1.96E+01	5.37E-07	2.52E-06	3.46E-10
7	165	1	Surface	Trichloroethene	mg/kg	6.10E-01	1.67E-08	3.93E-07	5.92E-06
7	170	1	Surface	PCB, Total	mg/kg	1.00E-01	2.74E-09	3.61E-08	2.98E-09
8	158	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
8	158	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
8	158	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
8	158	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
8	158	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
8	169	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
8	169	1	Surface	Cadmium	mg/kg	1.10E+00	3.01E-08	2.83E-09	1.94E-11
8	169	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
8	169	1	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
8	169	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
9	19	1	Surface	Antimony	mg/kg	9.81E+01	2.69E-06	1.26E-05	1.73E-09
9	19	1	Surface	Chromium	mg/kg	2.96E+01	8.11E-07	3.81E-06	5.23E-10
9	19	1	Surface	Cobalt	mg/kg	4.76E+01	1.30E-06	6.13E-06	8.41E-10
9	19	1	Surface	Silver	mg/kg	9.90E+00	2.71E-07	1.02E-06	1.75E-10
9	138	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	138	1	Surface	Hexachlorobenzene	mg/kg	4.30E-01	1.18E-08	1.11E-07	2.37E-07
9	138	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	138	1	Surface	Thallium	mg/kg	5.00E+00	1.37E-07	6.44E-07	8.84E-11
9	138	1	Surface	Trichloroethene	mg/kg	1.00E+00	2.74E-08	6.44E-07	9.70E-06
9	138	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	138	2	Surface	1,1-Dichloroethene	mg/kg	1.00E+00	2.74E-08	6.44E-07	1.60E-05
9	138	2	Surface	1,2-Dichloroethane	mg/kg	1.00E+00	2.74E-08	0.00E+00	1.77E-11
9	138	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
9	138	2	Surface	Benzene	mg/kg	1.00E+00	2.74E-08	6.44E-07	6.89E-06
9	138	2	Surface	Carbon tetrachloride	mg/kg	1.00E+00	2.74E-08	6.44E-07	1.28E-05
9	138	2	Surface	Chloroform	mg/kg	1.00E+00	2.74E-08	6.44E-07	7.83E-06
9	138	2	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
9	138	2	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
9	138	2	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	138	2	Surface	Naphthalene	mg/kg	2.50E+00	6.85E-08	1.61E-06	1.47E-06
9	138	2	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
9	138	2	Surface	Tetrachloroethene	mg/kg	1.00E+00	2.74E-08	6.44E-07	9.37E-06
9	138	2	Surface	Trichloroethene	mg/kg	1.00E+00	2.74E-08	6.44E-07	9.70E-06
9	138	2	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	138	2	Surface	Vinyl chloride	mg/kg	1.10E+00	3.01E-08	7.08E-07	2.05E-05
9	180	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	180	1	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
9	180	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	180	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	180	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	180	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	180	2	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	180	2	Surface	Hexachlorobenzene	mg/kg	4.40E-01	1.21E-08	1.13E-07	2.42E-07
9	180	2	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	180	2	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	180	2	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	180	2	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	180	2	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	180	3	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	180	3	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
9	180	3	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	180	3	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	180	3	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	180	3	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	180	4	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	180	4	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
9	180	4	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	180	4	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	180	4	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	180	4	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
9	181	1	Surface	Antimony	mg/kg	8.34E+00	2.28E-07	1.07E-06	1.47E-10
9	181	1	Surface	Cadmium	mg/kg	2.49E+00	6.82E-08	6.41E-09	4.40E-11
9	181	1	Surface	PCB, Total	mg/kg	1.30E-01	3.56E-09	4.69E-08	3.87E-09
9	195	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	1	Surface	Hexachlorobenzene	mg/kg	4.50E-01	1.23E-08	1.16E-07	2.48E-07
9	195	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	1	Surface	Pentachlorophenol	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	2	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	2	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
9	195	2	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	2	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
9	195	2	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	2	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	2	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	3	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	3	Surface	Hexachlorobenzene	mg/kg	4.30E-01	1.18E-08	1.11E-07	2.37E-07
9	195	3	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	3	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	3	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	3	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	3	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	4	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	4	Surface	Hexachlorobenzene	mg/kg	4.50E-01	1.23E-08	1.16E-07	2.48E-07
9	195	4	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	4	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	4	Surface	Pentachlorophenol	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	4	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	4	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	5	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	5	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
9	195	5	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	5	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	5	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	5	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	5	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	6	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	6	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
9	195	6	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	6	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	6	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	6	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	6	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	7	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	7	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
9	195	7	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	7	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
9	195	7	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	7	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
9	195	7	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	8	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	8	Surface	Hexachlorobenzene	mg/kg	4.40E-01	1.21E-08	1.13E-07	2.42E-07
9	195	8	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	8	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	8	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	8	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	8	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	9	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	9	Surface	Hexachlorobenzene	mg/kg	4.60E-01	1.26E-08	1.18E-07	2.53E-07
9	195	9	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	9	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	9	Surface	Pentachlorophenol	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	9	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	9	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	10	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	10	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
9	195	10	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	10	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	10	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	10	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	11	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	11	Surface	Hexachlorobenzene	mg/kg	4.30E-01	1.18E-08	1.11E-07	2.37E-07
9	195	11	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	11	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	11	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	11	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	11	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	12	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	12	Surface	Hexachlorobenzene	mg/kg	4.30E-01	1.18E-08	1.11E-07	2.37E-07
9	195	12	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	12	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	12	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	195	12	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	12	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	13	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	195	13	Surface	Hexachlorobenzene	mg/kg	3.90E-01	1.07E-08	1.00E-07	2.15E-07
9	195	13	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	13	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	13	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	195	13	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	13	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	14	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	14	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
9	195	14	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	14	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	14	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	14	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	14	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	15	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
9	195	15	Surface	Hexachlorobenzene	mg/kg	4.50E-01	1.23E-08	1.16E-07	2.48E-07
9	195	15	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	15	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
9	195	15	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	15	Surface	Pentachlorophenol	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	195	15	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	15	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	16	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	195	16	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
9	195	16	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
9	195	16	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
9	195	16	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
9	195	16	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
9	195	16	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	195	17	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	17	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
9	195	17	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	195	17	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	492	1	Surface	3,3'-Dichlorobenzidine	mg/kg	8.20E-01	2.25E-08	2.11E-07	1.45E-11
9	492	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	492	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.10E-01	1.12E-08	0.00E+00	7.25E-12
9	492	1	Surface	Hexachlorobenzene	mg/kg	4.10E-01	1.12E-08	1.06E-07	2.26E-07
9	492	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.10E-01	1.12E-08	1.06E-07	7.25E-12
9	492	1	Surface	Pentachlorophenol	mg/kg	2.00E+00	5.48E-08	5.15E-07	3.54E-11
9	492	1	Surface	Silver	mg/kg	4.00E+00	1.10E-07	4.12E-07	7.07E-11
9	492	1	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	492	1	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	493	1	Surface	3,3'-Dichlorobenzidine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
9	493	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	493	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	1.37E-08	0.00E+00	8.84E-12
9	493	1	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
9	493	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
9	493	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
9	493	1	Surface	Pentachlorophenol	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
9	493	1	Surface	Silver	mg/kg	4.00E+00	1.10E-07	4.12E-07	7.07E-11
9	493	1	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	493	1	Surface	Uranium	mg/kg	2.00E+03	5.48E-05	2.58E-04	3.54E-08
9	517	1	Surface	3,3'-Dichlorobenzidine	mg/kg	4.90E-01	1.34E-08	1.26E-07	8.66E-12
9	517	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	517	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.90E-01	1.34E-08	0.00E+00	8.66E-12
9	517	1	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
9	517	1	Surface	Hexachlorobenzene	mg/kg	4.90E-01	1.34E-08	1.26E-07	2.70E-07
9	517	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.90E-01	1.34E-08	1.26E-07	8.66E-12
9	517	1	Surface	Pentachlorophenol	mg/kg	4.90E-01	1.34E-08	1.26E-07	8.66E-12
9	517	1	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	517	1	Surface	Total PAH	mg/kg	4.90E-01	1.34E-08	1.64E-07	6.40E-10
9	517	1	Surface	Uranium	mg/kg	1.00E+02	2.74E-06	1.29E-05	1.77E-09
9	541	1	Surface	3,3'-Dichlorobenzidine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
9	541	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	541	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	1.37E-08	0.00E+00	8.84E-12

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
9	541	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
9	541	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
9	541	1	Surface	Pentachlorophenol	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
9	541	1	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
9	561	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	561	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.40E-01	1.21E-08	0.00E+00	7.78E-12
9	561	1	Surface	Cadmium	mg/kg	1.83E+00	5.01E-08	4.71E-09	3.23E-11
9	561	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
9	561	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.40E-01	1.21E-08	1.13E-07	7.78E-12
9	561	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
9	561	2	Surface	1,2,3-Trichloropropane	mg/kg	5.90E-03	1.62E-10	0.00E+00	1.04E-13
9	561	2	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	561	2	Surface	Bis(2-chloroethyl) ether	mg/kg	4.40E-01	1.21E-08	0.00E+00	7.78E-12
9	561	2	Surface	Hexachlorobenzene	mg/kg	4.90E-01	1.34E-08	1.26E-07	2.70E-07
9	561	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.40E-01	1.21E-08	1.13E-07	7.78E-12
9	561	2	Surface	Pentachlorophenol	mg/kg	2.20E+00	6.03E-08	5.67E-07	3.89E-11
9	561	2	Surface	Trans-1,4-Dichloro-2-butene	mg/kg	1.20E-02	3.29E-10	3.09E-09	2.12E-13
9	562	1	Surface	Antimony	mg/kg	8.20E+00	2.25E-07	1.06E-06	1.45E-10
9	562	1	Surface	Chromium	mg/kg	6.50E+01	1.78E-06	8.37E-06	1.15E-09
9	562	1	Surface	PCB, Total	mg/kg	1.00E+00	2.74E-08	3.61E-07	2.98E-08
9	562	1	Surface	Thallium	mg/kg	1.95E+00	5.34E-08	2.51E-07	3.45E-11
9	562	1	Surface	Total PAH	mg/kg	4.90E-01	1.34E-08	1.64E-07	6.40E-10
9	562	2	Surface	Antimony	mg/kg	8.30E+00	2.27E-07	1.07E-06	1.47E-10
9	562	2	Surface	Chromium	mg/kg	6.50E+01	1.78E-06	8.37E-06	1.15E-09
9	562	2	Surface	Thallium	mg/kg	1.93E+00	5.29E-08	2.49E-07	3.41E-11
9	562	2	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	562	3	Surface	Antimony	mg/kg	7.72E+00	2.12E-07	9.94E-07	1.36E-10
9	562	3	Surface	Thallium	mg/kg	1.79E+00	4.90E-08	2.30E-07	3.16E-11
9	562	4	Surface	Antimony	mg/kg	8.13E+00	2.23E-07	1.05E-06	1.44E-10
9	562	4	Surface	PCB, Total	mg/kg	1.00E+00	2.74E-08	3.61E-07	2.98E-08
9	562	4	Surface	Thallium	mg/kg	1.93E+00	5.29E-08	2.49E-07	3.41E-11
9	562	4	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	562	5	Surface	Antimony	mg/kg	9.53E+00	2.61E-07	1.23E-06	1.68E-10
9	562	5	Surface	Thallium	mg/kg	1.97E+00	5.40E-08	2.54E-07	3.48E-11
9	563	1	Surface	Antimony	mg/kg	8.26E+00	2.26E-07	1.06E-06	1.46E-10
9	563	1	Surface	Thallium	mg/kg	1.96E+00	5.37E-08	2.52E-07	3.46E-11
9	563	1	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	563	2	Surface	Antimony	mg/kg	7.85E+00	2.15E-07	1.01E-06	1.39E-10
9	563	2	Surface	Chromium	mg/kg	6.50E+01	1.78E-06	8.37E-06	1.15E-09
9	563	2	Surface	PCB, Total	mg/kg	1.00E+00	2.74E-08	3.61E-07	2.98E-08
9	563	2	Surface	Thallium	mg/kg	1.87E+00	5.12E-08	2.41E-07	3.31E-11
9	563	2	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	564	1	Surface	Antimony	mg/kg	8.83E+00	2.42E-07	1.14E-06	1.56E-10
9	564	1	Surface	Total PAH	mg/kg	4.90E-01	1.34E-08	1.64E-07	6.40E-10
9	567	1	Surface	Antimony	mg/kg	7.91E+00	2.17E-07	1.02E-06	1.40E-10
9	567	1	Surface	Cadmium	mg/kg	2.35E+00	6.44E-08	6.05E-09	4.15E-11
9	567	1	Surface	PCB, Total	mg/kg	1.30E-01	3.56E-09	4.69E-08	3.87E-09
9	567	1	Surface	Thallium	mg/kg	9.38E+00	2.57E-07	1.21E-06	1.66E-10
9	567	1	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	567	2	Surface	1,1-Dichloroethene	mg/kg	4.00E-02	1.10E-09	2.58E-08	6.41E-07

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
9	567	3	Surface	Antimony	mg/kg	8.14E+00	2.23E-07	1.05E-06	1.44E-10
9	567	3	Surface	Cadmium	mg/kg	2.27E+00	6.22E-08	5.85E-09	4.01E-11
9	567	3	Surface	PCB, Total	mg/kg	1.30E-01	3.56E-09	4.69E-08	3.87E-09
9	567	3	Surface	Thallium	mg/kg	9.08E+00	2.49E-07	1.17E-06	1.60E-10
9	567	3	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
9	567	4	Surface	Antimony	mg/kg	8.18E+00	2.24E-07	1.05E-06	1.45E-10
9	567	4	Surface	Cadmium	mg/kg	2.48E+00	6.79E-08	6.39E-09	4.38E-11
9	567	4	Surface	PCB, Total	mg/kg	1.30E-01	3.56E-09	4.69E-08	3.87E-09
9	567	4	Surface	Thallium	mg/kg	9.93E+00	2.72E-07	1.28E-06	1.76E-10
9	567	4	Surface	Total PAH	mg/kg	5.00E-01	1.37E-08	1.67E-07	6.53E-10
10	14	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
10	14	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
10	14	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	2	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
10	14	2	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	2	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	14	3	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	3	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
10	14	3	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	3	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	14	4	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
10	14	4	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
10	14	4	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
10	14	5	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
10	14	5	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
10	14	5	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
10	14	6	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	6	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
10	14	6	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	7	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
10	14	7	Surface	Hexachlorobenzene	mg/kg	4.00E-01	1.10E-08	1.03E-07	2.20E-07
10	14	7	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
10	14	7	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	14	8	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	8	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
10	14	8	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	9	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	9	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
10	14	9	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	9	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	14	10	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	10	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
10	14	10	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	14	10	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	518	1	Surface	1,2,4-Trichlorobenzene	mg/kg	2.40E+00	6.58E-08	0.00E+00	4.24E-11
10	518	1	Surface	1,4-Dichlorobenzene	mg/kg	2.40E+00	6.58E-08	0.00E+00	4.24E-11
10	518	1	Surface	2,4-Dinitrotoluene	mg/kg	2.40E+00	6.58E-08	6.30E-07	4.24E-11
10	518	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.40E+00	6.58E-08	6.18E-07	4.24E-11

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
10	518	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
10	518	1	Surface	Bis(2-chloroethyl) ether	mg/kg	2.40E+00	6.58E-08	0.00E+00	4.24E-11
10	518	1	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
10	518	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
10	518	1	Surface	Hexachloroethane	mg/kg	2.40E+00	6.58E-08	6.18E-07	4.24E-11
10	518	1	Surface	Naphthalene	mg/kg	2.40E+00	6.58E-08	1.55E-06	1.41E-06
10	518	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	2.40E+00	6.58E-08	6.18E-07	4.24E-11
10	518	1	Surface	Pentachlorophenol	mg/kg	2.40E+00	6.58E-08	6.18E-07	4.24E-11
10	518	1	Surface	Silver	mg/kg	4.00E+00	1.10E-07	4.12E-07	7.07E-11
10	518	1	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
10	520	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.60E+00	4.38E-08	4.12E-07	2.83E-11
10	520	1	Surface	Antimony	mg/kg	9.30E+00	2.55E-07	1.20E-06	1.64E-10
10	520	1	Surface	Cadmium	mg/kg	1.86E+00	5.10E-08	4.79E-09	3.29E-11
10	520	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
10	520	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
10	520	1	Surface	Pentachlorophenol	mg/kg	1.60E+00	4.38E-08	4.12E-07	2.83E-11
10	520	1	Surface	Thallium	mg/kg	1.86E+01	5.10E-07	2.40E-06	3.29E-10
10	520	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.60E+00	4.38E-08	4.12E-07	2.83E-11
10	520	2	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
10	520	2	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	1.37E-08	0.00E+00	8.84E-12
10	520	2	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
10	520	2	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
10	520	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
10	520	2	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
10	520	2	Surface	Pentachlorophenol	mg/kg	1.60E+00	4.38E-08	4.12E-07	2.83E-11
10	520	2	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	520	2	Surface	Thallium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
10	520	3	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	520	3	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
10	520	3	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
10	520	3	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
10	520	3	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	520	4	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	520	4	Surface	Hexachlorobenzene	mg/kg	3.40E-01	9.32E-09	8.76E-08	1.87E-07
10	520	4	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
10	520	4	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
10	520	5	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
10	520	5	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
10	520	5	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
10	520	5	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
10	520	5	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
10	520	5	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
10	520	5	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
11	81	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
11	81	1	Surface	Antimony	mg/kg	1.31E+01	3.59E-07	1.69E-06	2.32E-10
11	81	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.20E-01	1.15E-08	0.00E+00	7.42E-12
11	81	1	Surface	Hexachlorobenzene	mg/kg	4.20E-01	1.15E-08	1.08E-07	2.31E-07
11	81	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.20E-01	1.15E-08	1.08E-07	7.42E-12
11	81	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	5.75E-08	5.41E-07	3.71E-11
11	81	1	Surface	Thallium	mg/kg	8.00E-01	2.19E-08	1.03E-07	1.41E-11

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
11	153	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
11	153	1	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
11	153	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
11	153	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
11	153	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
11	153	1	Surface	Pentachlorophenol	mg/kg	1.90E+00	5.21E-08	4.89E-07	3.36E-11
11	153	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
11	153	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
11	156	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
11	156	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	1.04E-08	9.79E-08	2.09E-07
11	156	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
11	156	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
11	160	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
11	160	1	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
11	160	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	9.59E-09	9.01E-08	1.93E-07
11	160	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
11	160	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
11	160	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
11	160	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
11	160	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
11	160	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
11	163	1	Surface	1,1-Dichloroethene	mg/kg	1.68E-01	4.60E-09	1.08E-07	2.69E-06
11	163	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
11	163	1	Surface	Antimony	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
11	163	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	1.37E-08	0.00E+00	8.84E-12
11	163	1	Surface	Cadmium	mg/kg	2.00E+00	5.48E-08	5.15E-09	3.54E-11
11	163	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	1.37E-08	1.29E-07	2.75E-07
11	163	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
11	163	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09
11	163	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	1.37E-08	1.29E-07	8.84E-12
11	163	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
11	163	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	4.66E-08	4.38E-07	3.00E-11
11	163	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
11	163	1	Surface	Thallium	mg/kg	1.50E+01	4.11E-07	1.93E-06	2.65E-10
11	163	1	Surface	Trichloroethene	mg/kg	1.68E-01	4.60E-09	1.08E-07	1.63E-06
11	163	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
11	163	1	Surface	Vinyl chloride	mg/kg	1.68E-01	4.60E-09	1.08E-07	3.13E-06
11	219	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
11	219	1	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
11	219	1	Surface	Hexachlorobenzene	mg/kg	3.60E-01	9.86E-09	9.27E-08	1.98E-07
11	219	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
11	219	1	Surface	PCB, Total	mg/kg	5.00E+00	1.37E-07	1.80E-06	1.49E-07
11	219	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
11	219	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10
11	219	1	Surface	Uranium	mg/kg	2.00E+01	5.48E-07	2.58E-06	3.54E-10
11	488	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
11	488	1	Surface	Chromium	mg/kg	8.50E+01	2.33E-06	1.09E-05	1.50E-09
11	488	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	1.01E-08	9.53E-08	2.04E-07
11	488	1	Surface	Mercury	mg/kg	1.00E+01	2.74E-07	1.29E-06	5.27E-06
11	488	1	Surface	Nickel	mg/kg	6.50E+01	1.78E-06	6.70E-06	1.15E-09

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.3. Noncarcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation
11	488	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	4.93E-08	4.64E-07	3.18E-11
11	488	1	Surface	Silver	mg/kg	1.00E+01	2.74E-07	1.03E-06	1.77E-10

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
5	1	1	Surface	3,3'-Dichlorobenzidine	mg/kg	8.90E-01	8.71E-09	8.19E-08	5.62E-12	n/a
5	1	1	Surface	Antimony	mg/kg	9.65E+00	9.44E-08	4.44E-07	6.09E-11	n/a
5	1	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.40E-01	4.31E-09	0.00E+00	2.78E-12	n/a
5	1	1	Surface	Hexachlorobenzene	mg/kg	4.40E-01	4.31E-09	4.05E-08	8.65E-08	n/a
5	1	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.40E-01	4.31E-09	4.05E-08	2.78E-12	n/a
5	1	1	Surface	Pentachlorophenol	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
5	1	1	Surface	Silver	mg/kg	3.20E+00	3.13E-08	1.18E-07	2.02E-11	n/a
5	1	1	Surface	Thallium	mg/kg	1.93E+01	1.89E-07	8.88E-07	1.22E-10	n/a
5	1	1	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
5	1	2	Surface	3,3'-Dichlorobenzidine	mg/kg	9.30E-01	9.10E-09	8.55E-08	5.87E-12	n/a
5	1	2	Surface	Bis(2-chloroethyl) ether	mg/kg	4.60E-01	4.50E-09	0.00E+00	2.90E-12	n/a
5	1	2	Surface	Hexachlorobenzene	mg/kg	4.60E-01	4.50E-09	4.23E-08	9.05E-08	n/a
5	1	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.60E-01	4.50E-09	4.23E-08	2.90E-12	n/a
5	1	2	Surface	Pentachlorophenol	mg/kg	2.30E+00	2.25E-08	2.12E-07	1.45E-11	n/a
5	1	2	Surface	Total PAH	mg/kg	4.60E-01	4.50E-09	5.50E-08	2.15E-10	n/a
5	1	3	Surface	1,4-Dichlorobenzene	mg/kg	2.30E+00	2.25E-08	0.00E+00	1.45E-11	n/a
5	1	3	Surface	Antimony	mg/kg	1.50E+01	1.47E-07	6.90E-07	9.47E-11	n/a
5	1	3	Surface	Bis(2-chloroethyl) ether	mg/kg	3.30E-01	3.23E-09	0.00E+00	2.08E-12	n/a
5	1	3	Surface	Cadmium	mg/kg	3.00E+00	2.94E-08	2.76E-09	1.89E-11	n/a
5	1	3	Surface	Hexachlorobenzene	mg/kg	2.30E+00	2.25E-08	2.12E-07	4.52E-07	n/a
5	1	3	Surface	Hexachlorobutadiene	mg/kg	2.30E+00	2.25E-08	2.12E-07	1.45E-11	n/a
5	1	3	Surface	Hexachloroethane	mg/kg	2.30E+00	2.25E-08	2.12E-07	1.45E-11	n/a
5	1	3	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.30E-01	3.23E-09	3.04E-08	2.08E-12	n/a
5	1	3	Surface	Pentachlorophenol	mg/kg	2.30E+00	2.25E-08	2.12E-07	1.45E-11	n/a
5	1	3	Surface	Silver	mg/kg	4.00E+00	3.91E-08	1.47E-07	2.53E-11	n/a
5	1	3	Surface	Thallium	mg/kg	2.50E+01	2.45E-07	1.15E-06	1.58E-10	n/a
5	1	3	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
5	1	4	Surface	3,3'-Dichlorobenzidine	mg/kg	7.80E-01	7.63E-09	7.17E-08	4.92E-12	n/a
5	1	4	Surface	Antimony	mg/kg	1.22E+01	1.19E-07	5.61E-07	7.70E-11	n/a
5	1	4	Surface	Bis(2-chloroethyl) ether	mg/kg	3.90E-01	3.82E-09	0.00E+00	2.46E-12	n/a
5	1	4	Surface	Cadmium	mg/kg	1.80E+00	1.76E-08	1.66E-09	1.14E-11	n/a
5	1	4	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
5	1	4	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.90E-01	3.82E-09	3.59E-08	2.46E-12	n/a
5	1	4	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	1	4	Surface	Thallium	mg/kg	1.80E+01	1.76E-07	8.28E-07	1.14E-10	n/a
5	1	4	Surface	Total PAH	mg/kg	4.80E-01	4.70E-09	5.74E-08	2.24E-10	n/a
5	1	5	Surface	3,3'-Dichlorobenzidine	mg/kg	8.20E-01	8.02E-09	7.54E-08	5.18E-12	n/a
5	1	5	Surface	Antimony	mg/kg	9.75E+00	9.54E-08	4.48E-07	6.15E-11	n/a
5	1	5	Surface	Bis(2-chloroethyl) ether	mg/kg	4.10E-01	4.01E-09	0.00E+00	2.59E-12	n/a
5	1	5	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	1	5	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.10E-01	4.01E-09	3.77E-08	2.59E-12	n/a
5	1	5	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	1	5	Surface	Thallium	mg/kg	1.95E+01	1.91E-07	8.97E-07	1.23E-10	n/a
5	99	1	Surface	Antimony	mg/kg	9.72E+00	9.51E-08	4.47E-07	6.14E-11	n/a
5	99	1	Surface	Cadmium	mg/kg	1.94E+00	1.90E-08	1.78E-09	1.22E-11	n/a
5	99	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	99	1	Surface	Thallium	mg/kg	1.94E+01	1.90E-07	8.92E-07	1.22E-10	n/a
5	99	1	Surface	Total PAH	mg/kg	4.80E-01	4.70E-09	5.74E-08	2.24E-10	n/a
5	99	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
5	194	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	194	1	Surface	Hexachlorobenzene	mg/kg	4.30E-01	4.21E-09	3.95E-08	8.46E-08	n/a
5	194	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	194	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	2	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
5	194	2	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	2	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	2	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	2	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	3	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	3	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	194	3	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	3	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	3	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	3	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	3	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	4	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	4	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	194	4	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	4	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	4	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	5	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	5	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	194	5	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	5	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	5	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	6	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	6	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
5	194	6	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	6	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	6	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	6	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	7	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	7	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
5	194	7	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	7	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	7	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	7	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	8	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	8	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
5	194	8	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	8	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	8	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	8	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	8	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	8	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	9	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
5	194	9	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
5	194	9	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	9	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	9	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	9	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	9	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	9	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	10	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	10	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
5	194	10	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	10	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	10	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	10	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	10	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	11	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	194	11	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
5	194	11	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	194	11	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	12	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	194	12	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
5	194	12	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	12	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	12	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	194	12	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	13	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	13	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
5	194	13	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	13	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	13	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	13	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	13	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	14	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	14	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
5	194	14	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	14	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	14	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	14	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	14	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	15	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	15	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	15	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	15	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	16	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	16	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	194	16	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	16	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	16	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	16	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	16	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
5	194	17	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	194	17	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
5	194	17	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	17	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	17	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	17	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	194	17	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	17	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	18	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	18	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
5	194	18	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	18	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	18	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	18	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	18	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	19	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	194	19	Surface	Hexachlorobenzene	mg/kg	4.40E-01	4.31E-09	4.05E-08	8.65E-08	n/a
5	194	19	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	19	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	19	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	194	19	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	19	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	20	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	20	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
5	194	20	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	20	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	20	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	21	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	21	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
5	194	21	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	21	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	21	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	21	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	22	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	22	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
5	194	22	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	22	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	22	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	22	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	22	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	23	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	23	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	194	23	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	23	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	23	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	23	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	24	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	194	24	Surface	Hexachlorobenzene	mg/kg	4.40E-01	4.31E-09	4.05E-08	8.65E-08	n/a
5	194	24	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
5	194	24	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	24	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
5	194	24	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	24	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	25	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	25	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
5	194	25	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	25	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	25	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	25	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	194	25	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	26	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	26	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
5	194	26	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	26	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
5	194	26	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	26	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	26	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	27	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	27	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
5	194	27	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	27	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	27	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	27	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	28	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	28	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
5	194	28	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	28	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	28	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
5	194	28	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	29	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
5	194	29	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
5	194	29	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	194	29	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	29	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
5	194	29	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	30	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	30	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
5	194	30	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	194	30	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
5	194	30	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	31	Surface	3,3'-Dichlorobenzidine	mg/kg	4.70E-01	4.60E-09	4.32E-08	2.97E-12	n/a
5	194	31	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	31	Surface	Bis(2-chloroethyl) ether	mg/kg	4.70E-01	4.60E-09	0.00E+00	2.97E-12	n/a
5	194	31	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
5	194	31	Surface	Hexachlorobenzene	mg/kg	4.70E-01	4.60E-09	4.32E-08	9.24E-08	n/a
5	194	31	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.70E-01	4.60E-09	4.32E-08	2.97E-12	n/a
5	194	31	Surface	PCB, Total	mg/kg	1.00E-01	9.78E-10	1.29E-08	1.06E-09	n/a
5	194	31	Surface	Pentachlorophenol	mg/kg	4.70E-01	4.60E-09	4.32E-08	2.97E-12	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
5	194	31	Surface	Silver	mg/kg	4.00E+00	3.91E-08	1.47E-07	2.53E-11	n/a
5	194	31	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	194	31	Surface	Total PAH	mg/kg	4.70E-01	4.60E-09	5.62E-08	2.19E-10	n/a
5	196	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
5	196	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
5	196	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	196	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	196	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
5	196	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	196	2	Surface	Benzene	mg/kg	1.00E+00	9.78E-09	2.30E-07	2.46E-06	n/a
5	196	2	Surface	Silver	mg/kg	3.00E+00	2.94E-08	1.10E-07	1.89E-11	n/a
5	489	1	Surface	1,2,3-Trichloropropane	mg/kg	5.70E-03	5.58E-11	0.00E+00	3.60E-14	n/a
5	489	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
5	489	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
5	489	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	489	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	489	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
5	489	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
5	489	1	Surface	Trans-1,4-Dichloro-2-butene	mg/kg	1.10E-02	1.08E-10	1.01E-09	6.94E-14	n/a
5	489	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
5	531	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	531	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
5	531	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
5	531	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
5	531	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
5	531	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	200	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	200	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
6	200	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	200	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	212	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	212	1	Surface	Antimony	mg/kg	9.74E+00	9.53E-08	4.48E-07	6.15E-11	n/a
6	212	1	Surface	Bis(2-chloroethyl) ether	mg/kg	3.30E-01	3.23E-09	0.00E+00	2.08E-12	n/a
6	212	1	Surface	Cadmium	mg/kg	1.95E+00	1.91E-08	1.79E-09	1.23E-11	n/a
6	212	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
6	212	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	212	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.30E-01	3.23E-09	3.04E-08	2.08E-12	n/a
6	212	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	212	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	212	1	Surface	Thallium	mg/kg	1.95E+01	1.91E-07	8.97E-07	1.23E-10	n/a
6	212	1	Surface	Total PAH	mg/kg	4.90E-01	4.79E-09	5.86E-08	2.29E-10	n/a
6	213	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	213	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
6	213	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	213	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	213	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	213	2	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	213	2	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	213	2	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
6	214	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	214	1	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
6	214	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
6	214	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	214	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
6	214	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	214	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	214	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	214	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	215	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	215	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
6	215	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	215	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	215	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	215	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	215	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	216	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	216	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
6	216	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	216	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
6	216	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	216	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	216	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	217	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	217	1	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
6	217	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	217	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	217	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	217	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	217	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	217	2	Surface	Bis(2-chloroethyl) ether	mg/kg	3.70E-01	3.62E-09	0.00E+00	2.34E-12	n/a
6	217	2	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
6	217	2	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
6	217	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.70E-01	3.62E-09	3.40E-08	2.34E-12	n/a
6	217	2	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	217	2	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
6	217	2	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	217	2	Surface	Uranium	mg/kg	2.00E+02	1.96E-06	9.20E-06	1.26E-09	n/a
6	221	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	221	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
6	221	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	221	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	221	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	222	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
6	222	1	Surface	Antimony	mg/kg	7.00E-01	6.85E-09	3.22E-08	4.42E-12	n/a
6	222	1	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
6	222	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	222	1	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
6	222	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
6	227	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	227	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	227	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	4.89E-09	0.00E+00	3.16E-12	n/a
6	227	1	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
6	227	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
6	227	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
6	227	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
6	227	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	227	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	227	1	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	227	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	227	2	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	227	2	Surface	Bis(2-chloroethyl) ether	mg/kg	4.80E-01	4.70E-09	0.00E+00	3.03E-12	n/a
6	227	2	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
6	227	2	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
6	227	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.80E-01	4.70E-09	4.41E-08	3.03E-12	n/a
6	227	2	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
6	227	2	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
6	227	2	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
6	228	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.60E+00	1.57E-08	1.47E-07	1.01E-11	n/a
6	228	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
6	228	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
6	228	1	Surface	Pentachlorophenol	mg/kg	1.60E+00	1.57E-08	1.47E-07	1.01E-11	n/a
7	76	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
7	76	1	Surface	Antimony	mg/kg	5.70E-01	5.58E-09	2.62E-08	3.60E-12	n/a
7	76	1	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
7	76	1	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
7	76	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
7	76	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
7	76	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
7	76	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
7	76	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
7	165	1	Surface	1,1-Dichloroethene	mg/kg	6.10E-01	5.97E-09	1.40E-07	3.49E-06	n/a
7	165	1	Surface	1,2-Dichloroethane	mg/kg	6.10E-01	5.97E-09	0.00E+00	3.85E-12	n/a
7	165	1	Surface	3,3'-Dichlorobenzidine	mg/kg	7.50E-01	7.34E-09	6.90E-08	4.73E-12	n/a
7	165	1	Surface	Benzene	mg/kg	6.10E-01	5.97E-09	1.40E-07	1.50E-06	n/a
7	165	1	Surface	Bis(2-chloroethyl) ether	mg/kg	3.70E-01	3.62E-09	0.00E+00	2.34E-12	n/a
7	165	1	Surface	Cadmium	mg/kg	5.00E+00	4.89E-08	4.60E-09	3.16E-11	n/a
7	165	1	Surface	Carbon tetrachloride	mg/kg	6.10E-01	5.97E-09	1.40E-07	2.79E-06	n/a
7	165	1	Surface	Chloroform	mg/kg	6.10E-01	5.97E-09	1.40E-07	1.71E-06	n/a
7	165	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
7	165	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	3.70E-01	3.62E-09	3.40E-08	2.34E-12	n/a
7	165	1	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
7	165	1	Surface	Tetrachloroethene	mg/kg	6.10E-01	5.97E-09	1.40E-07	2.04E-06	n/a
7	165	1	Surface	Thallium	mg/kg	1.96E+01	1.92E-07	9.01E-07	1.24E-10	n/a
7	165	1	Surface	Trichloroethene	mg/kg	6.10E-01	5.97E-09	1.40E-07	2.11E-06	n/a
7	170	1	Surface	PCB, Total	mg/kg	1.00E-01	9.78E-10	1.29E-08	1.06E-09	n/a
8	158	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
8	158	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
8	158	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
8	158	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
8	158	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
8	169	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
8	169	1	Surface	Cadmium	mg/kg	1.10E+00	1.08E-08	1.01E-09	6.94E-12	n/a
8	169	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
8	169	1	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
8	169	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	19	1	Surface	Antimony	mg/kg	9.81E+01	9.60E-07	4.51E-06	6.19E-10	n/a
9	19	1	Surface	Chromium	mg/kg	2.96E+01	2.90E-07	1.36E-06	1.87E-10	n/a
9	19	1	Surface	Cobalt	mg/kg	4.76E+01	4.66E-07	2.19E-06	3.00E-10	n/a
9	19	1	Surface	Silver	mg/kg	9.90E+00	9.69E-08	3.64E-07	6.25E-11	n/a
9	138	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	138	1	Surface	Hexachlorobenzene	mg/kg	4.30E-01	4.21E-09	3.95E-08	8.46E-08	n/a
9	138	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	138	1	Surface	Thallium	mg/kg	5.00E+00	4.89E-08	2.30E-07	3.16E-11	n/a
9	138	1	Surface	Trichloroethene	mg/kg	1.00E+00	9.78E-09	2.30E-07	3.46E-06	n/a
9	138	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	138	2	Surface	1,1-Dichloroethene	mg/kg	1.00E+00	9.78E-09	2.30E-07	5.72E-06	n/a
9	138	2	Surface	1,2-Dichloroethane	mg/kg	1.00E+00	9.78E-09	0.00E+00	6.31E-12	n/a
9	138	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
9	138	2	Surface	Benzene	mg/kg	1.00E+00	9.78E-09	2.30E-07	2.46E-06	n/a
9	138	2	Surface	Carbon tetrachloride	mg/kg	1.00E+00	9.78E-09	2.30E-07	4.57E-06	n/a
9	138	2	Surface	Chloroform	mg/kg	1.00E+00	9.78E-09	2.30E-07	2.80E-06	n/a
9	138	2	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
9	138	2	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
9	138	2	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	138	2	Surface	Naphthalene	mg/kg	2.50E+00	2.45E-08	5.75E-07	5.26E-07	n/a
9	138	2	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
9	138	2	Surface	Tetrachloroethene	mg/kg	1.00E+00	9.78E-09	2.30E-07	3.35E-06	n/a
9	138	2	Surface	Trichloroethene	mg/kg	1.00E+00	9.78E-09	2.30E-07	3.46E-06	n/a
9	138	2	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	138	2	Surface	Vinyl chloride	mg/kg	1.10E+00	1.08E-08	2.53E-07	7.31E-06	n/a
9	180	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	180	1	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
9	180	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	180	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	180	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	180	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	180	2	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	180	2	Surface	Hexachlorobenzene	mg/kg	4.40E-01	4.31E-09	4.05E-08	8.65E-08	n/a
9	180	2	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	180	2	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	180	2	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	180	2	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	180	2	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	180	3	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	180	3	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
9	180	3	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
9	180	3	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	180	3	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	180	3	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	180	4	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	180	4	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
9	180	4	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	180	4	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	180	4	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	180	4	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	181	1	Surface	Antimony	mg/kg	8.34E+00	8.16E-08	3.84E-07	5.26E-11	n/a
9	181	1	Surface	Cadmium	mg/kg	2.49E+00	2.44E-08	2.29E-09	1.57E-11	n/a
9	181	1	Surface	PCB, Total	mg/kg	1.30E-01	1.27E-09	1.67E-08	1.38E-09	n/a
9	195	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	1	Surface	Hexachlorobenzene	mg/kg	4.50E-01	4.40E-09	4.14E-08	8.85E-08	n/a
9	195	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	1	Surface	Pentachlorophenol	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	2	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	2	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
9	195	2	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	2	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
9	195	2	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	2	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	2	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	3	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	3	Surface	Hexachlorobenzene	mg/kg	4.30E-01	4.21E-09	3.95E-08	8.46E-08	n/a
9	195	3	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	3	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	3	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	3	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	3	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	4	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	4	Surface	Hexachlorobenzene	mg/kg	4.50E-01	4.40E-09	4.14E-08	8.85E-08	n/a
9	195	4	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	4	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	4	Surface	Pentachlorophenol	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	4	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	4	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	5	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	5	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
9	195	5	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	5	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	5	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	5	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	5	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	6	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	6	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
9	195	6	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
9	195	6	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	6	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	6	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	6	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	7	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	7	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
9	195	7	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	7	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
9	195	7	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	7	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	7	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	8	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	8	Surface	Hexachlorobenzene	mg/kg	4.40E-01	4.31E-09	4.05E-08	8.65E-08	n/a
9	195	8	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	8	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	8	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	8	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	8	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	9	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	9	Surface	Hexachlorobenzene	mg/kg	4.60E-01	4.50E-09	4.23E-08	9.05E-08	n/a
9	195	9	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	9	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	9	Surface	Pentachlorophenol	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	9	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	9	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	10	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	10	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
9	195	10	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	10	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	10	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	10	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	11	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	11	Surface	Hexachlorobenzene	mg/kg	4.30E-01	4.21E-09	3.95E-08	8.46E-08	n/a
9	195	11	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	11	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	11	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	11	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	11	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	12	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	12	Surface	Hexachlorobenzene	mg/kg	4.30E-01	4.21E-09	3.95E-08	8.46E-08	n/a
9	195	12	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	12	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	12	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	195	12	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	12	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	13	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	195	13	Surface	Hexachlorobenzene	mg/kg	3.90E-01	3.82E-09	3.59E-08	7.67E-08	n/a
9	195	13	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	13	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
9	195	13	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	195	13	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	13	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	14	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	14	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
9	195	14	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	14	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	14	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	14	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	14	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	15	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	15	Surface	Hexachlorobenzene	mg/kg	4.50E-01	4.40E-09	4.14E-08	8.85E-08	n/a
9	195	15	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	15	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
9	195	15	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	15	Surface	Pentachlorophenol	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	195	15	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	15	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	16	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	195	16	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
9	195	16	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
9	195	16	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
9	195	16	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
9	195	16	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
9	195	16	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	195	17	Surface	3,3'-Dichlorobenzidine	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	17	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
9	195	17	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	195	17	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	492	1	Surface	3,3'-Dichlorobenzidine	mg/kg	8.20E-01	8.02E-09	7.54E-08	5.18E-12	n/a
9	492	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	492	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.10E-01	4.01E-09	0.00E+00	2.59E-12	n/a
9	492	1	Surface	Hexachlorobenzene	mg/kg	4.10E-01	4.01E-09	3.77E-08	8.06E-08	n/a
9	492	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.10E-01	4.01E-09	3.77E-08	2.59E-12	n/a
9	492	1	Surface	Pentachlorophenol	mg/kg	2.00E+00	1.96E-08	1.84E-07	1.26E-11	n/a
9	492	1	Surface	Silver	mg/kg	4.00E+00	3.91E-08	1.47E-07	2.53E-11	n/a
9	492	1	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	492	1	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
9	493	1	Surface	3,3'-Dichlorobenzidine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
9	493	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	493	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	4.89E-09	0.00E+00	3.16E-12	n/a
9	493	1	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
9	493	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
9	493	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
9	493	1	Surface	Pentachlorophenol	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
9	493	1	Surface	Silver	mg/kg	4.00E+00	3.91E-08	1.47E-07	2.53E-11	n/a
9	493	1	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	493	1	Surface	Uranium	mg/kg	2.00E+03	1.96E-05	9.20E-05	1.26E-08	n/a
9	517	1	Surface	3,3'-Dichlorobenzidine	mg/kg	4.90E-01	4.79E-09	4.51E-08	3.09E-12	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
9	517	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	517	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.90E-01	4.79E-09	0.00E+00	3.09E-12	n/a
9	517	1	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
9	517	1	Surface	Hexachlorobenzene	mg/kg	4.90E-01	4.79E-09	4.51E-08	9.64E-08	n/a
9	517	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.90E-01	4.79E-09	4.51E-08	3.09E-12	n/a
9	517	1	Surface	Pentachlorophenol	mg/kg	4.90E-01	4.79E-09	4.51E-08	3.09E-12	n/a
9	517	1	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	517	1	Surface	Total PAH	mg/kg	4.90E-01	4.79E-09	5.86E-08	2.29E-10	n/a
9	517	1	Surface	Uranium	mg/kg	1.00E+02	9.78E-07	4.60E-06	6.31E-10	n/a
9	541	1	Surface	3,3'-Dichlorobenzidine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
9	541	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	541	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	4.89E-09	0.00E+00	3.16E-12	n/a
9	541	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
9	541	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
9	541	1	Surface	Pentachlorophenol	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
9	541	1	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
9	561	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	561	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.40E-01	4.31E-09	0.00E+00	2.78E-12	n/a
9	561	1	Surface	Cadmium	mg/kg	1.83E+00	1.79E-08	1.68E-09	1.16E-11	n/a
9	561	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
9	561	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.40E-01	4.31E-09	4.05E-08	2.78E-12	n/a
9	561	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
9	561	2	Surface	1,2,3-Trichloropropane	mg/kg	5.90E-03	5.77E-11	0.00E+00	3.72E-14	n/a
9	561	2	Surface	3,3'-Dichlorobenzidine	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	561	2	Surface	Bis(2-chloroethyl) ether	mg/kg	4.40E-01	4.31E-09	0.00E+00	2.78E-12	n/a
9	561	2	Surface	Hexachlorobenzene	mg/kg	4.90E-01	4.79E-09	4.51E-08	9.64E-08	n/a
9	561	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.40E-01	4.31E-09	4.05E-08	2.78E-12	n/a
9	561	2	Surface	Pentachlorophenol	mg/kg	2.20E+00	2.15E-08	2.02E-07	1.39E-11	n/a
9	561	2	Surface	Trans-1,4-Dichloro-2-butene	mg/kg	1.20E-02	1.17E-10	1.10E-09	7.58E-14	n/a
9	562	1	Surface	Antimony	mg/kg	8.20E+00	8.02E-08	3.77E-07	5.18E-11	n/a
9	562	1	Surface	Chromium	mg/kg	6.50E+01	6.36E-07	2.99E-06	4.10E-10	n/a
9	562	1	Surface	PCB, Total	mg/kg	1.00E+00	9.78E-09	1.29E-07	1.06E-08	n/a
9	562	1	Surface	Thallium	mg/kg	1.95E+00	1.91E-08	8.97E-08	1.23E-11	n/a
9	562	1	Surface	Total PAH	mg/kg	4.90E-01	4.79E-09	5.86E-08	2.29E-10	n/a
9	562	2	Surface	Antimony	mg/kg	8.30E+00	8.12E-08	3.82E-07	5.24E-11	n/a
9	562	2	Surface	Chromium	mg/kg	6.50E+01	6.36E-07	2.99E-06	4.10E-10	n/a
9	562	2	Surface	Thallium	mg/kg	1.93E+00	1.89E-08	8.88E-08	1.22E-11	n/a
9	562	2	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
9	562	3	Surface	Antimony	mg/kg	7.72E+00	7.55E-08	3.55E-07	4.87E-11	n/a
9	562	3	Surface	Thallium	mg/kg	1.79E+00	1.75E-08	8.23E-08	1.13E-11	n/a
9	562	4	Surface	Antimony	mg/kg	8.13E+00	7.95E-08	3.74E-07	5.13E-11	n/a
9	562	4	Surface	PCB, Total	mg/kg	1.00E+00	9.78E-09	1.29E-07	1.06E-08	n/a
9	562	4	Surface	Thallium	mg/kg	1.93E+00	1.89E-08	8.88E-08	1.22E-11	n/a
9	562	4	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
9	562	5	Surface	Antimony	mg/kg	9.53E+00	9.32E-08	4.38E-07	6.02E-11	n/a
9	562	5	Surface	Thallium	mg/kg	1.97E+00	1.93E-08	9.06E-08	1.24E-11	n/a
9	563	1	Surface	Antimony	mg/kg	8.26E+00	8.08E-08	3.80E-07	5.21E-11	n/a
9	563	1	Surface	Thallium	mg/kg	1.96E+00	1.92E-08	9.01E-08	1.24E-11	n/a
9	563	1	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
9	563	2	Surface	Antimony	mg/kg	7.85E+00	7.68E-08	3.61E-07	4.96E-11	n/a
9	563	2	Surface	Chromium	mg/kg	6.50E+01	6.36E-07	2.99E-06	4.10E-10	n/a
9	563	2	Surface	PCB, Total	mg/kg	1.00E+00	9.78E-09	1.29E-07	1.06E-08	n/a
9	563	2	Surface	Thallium	mg/kg	1.87E+00	1.83E-08	8.60E-08	1.18E-11	n/a
9	563	2	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
9	564	1	Surface	Antimony	mg/kg	8.83E+00	8.64E-08	4.06E-07	5.57E-11	n/a
9	564	1	Surface	Total PAH	mg/kg	4.90E-01	4.79E-09	5.86E-08	2.29E-10	n/a
9	567	1	Surface	Antimony	mg/kg	7.91E+00	7.74E-08	3.64E-07	4.99E-11	n/a
9	567	1	Surface	Cadmium	mg/kg	2.35E+00	2.30E-08	2.16E-09	1.48E-11	n/a
9	567	1	Surface	PCB, Total	mg/kg	1.30E-01	1.27E-09	1.67E-08	1.38E-09	n/a
9	567	1	Surface	Thallium	mg/kg	9.38E+00	9.18E-08	4.31E-07	5.92E-11	n/a
9	567	1	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
9	567	2	Surface	1,1-Dichloroethene	mg/kg	4.00E-02	3.91E-10	9.20E-09	2.29E-07	n/a
9	567	3	Surface	Antimony	mg/kg	8.14E+00	7.96E-08	3.74E-07	5.14E-11	n/a
9	567	3	Surface	Cadmium	mg/kg	2.27E+00	2.22E-08	2.09E-09	1.43E-11	n/a
9	567	3	Surface	PCB, Total	mg/kg	1.30E-01	1.27E-09	1.67E-08	1.38E-09	n/a
9	567	3	Surface	Thallium	mg/kg	9.08E+00	8.88E-08	4.18E-07	5.73E-11	n/a
9	567	3	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
9	567	4	Surface	Antimony	mg/kg	8.18E+00	8.00E-08	3.76E-07	5.16E-11	n/a
9	567	4	Surface	Cadmium	mg/kg	2.48E+00	2.43E-08	2.28E-09	1.57E-11	n/a
9	567	4	Surface	PCB, Total	mg/kg	1.30E-01	1.27E-09	1.67E-08	1.38E-09	n/a
9	567	4	Surface	Thallium	mg/kg	9.93E+00	9.72E-08	4.57E-07	6.27E-11	n/a
9	567	4	Surface	Total PAH	mg/kg	5.00E-01	4.89E-09	5.98E-08	2.33E-10	n/a
10	14	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
10	14	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
10	14	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	2	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
10	14	2	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	2	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	14	3	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	3	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
10	14	3	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	3	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	14	4	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
10	14	4	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
10	14	4	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
10	14	5	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
10	14	5	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
10	14	5	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
10	14	6	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	6	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
10	14	6	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	7	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
10	14	7	Surface	Hexachlorobenzene	mg/kg	4.00E-01	3.91E-09	3.68E-08	7.87E-08	n/a
10	14	7	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
10	14	7	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	14	8	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
10	14	8	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
10	14	8	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	9	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	9	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
10	14	9	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	9	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	14	10	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	10	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
10	14	10	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	14	10	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	518	1	Surface	1,2,4-Trichlorobenzene	mg/kg	2.40E+00	2.35E-08	0.00E+00	1.52E-11	n/a
10	518	1	Surface	1,4-Dichlorobenzene	mg/kg	2.40E+00	2.35E-08	0.00E+00	1.52E-11	n/a
10	518	1	Surface	2,4-Dinitrotoluene	mg/kg	2.40E+00	2.35E-08	2.25E-07	1.52E-11	n/a
10	518	1	Surface	3,3'-Dichlorobenzidine	mg/kg	2.40E+00	2.35E-08	2.21E-07	1.52E-11	n/a
10	518	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
10	518	1	Surface	Bis(2-chloroethyl) ether	mg/kg	2.40E+00	2.35E-08	0.00E+00	1.52E-11	n/a
10	518	1	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
10	518	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
10	518	1	Surface	Hexachloroethane	mg/kg	2.40E+00	2.35E-08	2.21E-07	1.52E-11	n/a
10	518	1	Surface	Naphthalene	mg/kg	2.40E+00	2.35E-08	5.52E-07	5.05E-07	n/a
10	518	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	2.40E+00	2.35E-08	2.21E-07	1.52E-11	n/a
10	518	1	Surface	Pentachlorophenol	mg/kg	2.40E+00	2.35E-08	2.21E-07	1.52E-11	n/a
10	518	1	Surface	Silver	mg/kg	4.00E+00	3.91E-08	1.47E-07	2.53E-11	n/a
10	518	1	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
10	520	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.60E+00	1.57E-08	1.47E-07	1.01E-11	n/a
10	520	1	Surface	Antimony	mg/kg	9.30E+00	9.10E-08	4.28E-07	5.87E-11	n/a
10	520	1	Surface	Cadmium	mg/kg	1.86E+00	1.82E-08	1.71E-09	1.17E-11	n/a
10	520	1	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
10	520	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
10	520	1	Surface	Pentachlorophenol	mg/kg	1.60E+00	1.57E-08	1.47E-07	1.01E-11	n/a
10	520	1	Surface	Thallium	mg/kg	1.86E+01	1.82E-07	8.55E-07	1.17E-10	n/a
10	520	2	Surface	3,3'-Dichlorobenzidine	mg/kg	1.60E+00	1.57E-08	1.47E-07	1.01E-11	n/a
10	520	2	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
10	520	2	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	4.89E-09	0.00E+00	3.16E-12	n/a
10	520	2	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
10	520	2	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
10	520	2	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
10	520	2	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
10	520	2	Surface	Pentachlorophenol	mg/kg	1.60E+00	1.57E-08	1.47E-07	1.01E-11	n/a
10	520	2	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	520	2	Surface	Thallium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
10	520	3	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	520	3	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
10	520	3	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
10	520	3	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
10	520	3	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	520	4	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	520	4	Surface	Hexachlorobenzene	mg/kg	3.40E-01	3.33E-09	3.13E-08	6.69E-08	n/a
10	520	4	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
10	520	4	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
10	520	5	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
10	520	5	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
10	520	5	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
10	520	5	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
10	520	5	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
10	520	5	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
10	520	5	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
11	81	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
11	81	1	Surface	Antimony	mg/kg	1.31E+01	1.28E-07	6.02E-07	8.27E-11	n/a
11	81	1	Surface	Bis(2-chloroethyl) ether	mg/kg	4.20E-01	4.11E-09	0.00E+00	2.65E-12	n/a
11	81	1	Surface	Hexachlorobenzene	mg/kg	4.20E-01	4.11E-09	3.86E-08	8.26E-08	n/a
11	81	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	4.20E-01	4.11E-09	3.86E-08	2.65E-12	n/a
11	81	1	Surface	Pentachlorophenol	mg/kg	2.10E+00	2.05E-08	1.93E-07	1.33E-11	n/a
11	81	1	Surface	Thallium	mg/kg	8.00E-01	7.83E-09	3.68E-08	5.05E-12	n/a
11	153	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
11	153	1	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
11	153	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
11	153	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
11	153	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
11	153	1	Surface	Pentachlorophenol	mg/kg	1.90E+00	1.86E-08	1.75E-07	1.20E-11	n/a
11	153	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
11	153	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
11	156	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
11	156	1	Surface	Hexachlorobenzene	mg/kg	3.80E-01	3.72E-09	3.50E-08	7.47E-08	n/a
11	156	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
11	156	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
11	160	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
11	160	1	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
11	160	1	Surface	Hexachlorobenzene	mg/kg	3.50E-01	3.42E-09	3.22E-08	6.88E-08	n/a
11	160	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
11	160	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
11	160	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
11	160	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
11	160	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
11	160	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
11	163	1	Surface	1,1-Dichloroethene	mg/kg	1.68E-01	1.64E-09	3.86E-08	9.61E-07	n/a
11	163	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
11	163	1	Surface	Antimony	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
11	163	1	Surface	Bis(2-chloroethyl) ether	mg/kg	5.00E-01	4.89E-09	0.00E+00	3.16E-12	n/a
11	163	1	Surface	Cadmium	mg/kg	2.00E+00	1.96E-08	1.84E-09	1.26E-11	n/a
11	163	1	Surface	Hexachlorobenzene	mg/kg	5.00E-01	4.89E-09	4.60E-08	9.83E-08	n/a
11	163	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
11	163	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
11	163	1	Surface	N-Nitroso-di-n-propylamine	mg/kg	5.00E-01	4.89E-09	4.60E-08	3.16E-12	n/a
11	163	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
11	163	1	Surface	Pentachlorophenol	mg/kg	1.70E+00	1.66E-08	1.56E-07	1.07E-11	n/a
11	163	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
11	163	1	Surface	Thallium	mg/kg	1.50E+01	1.47E-07	6.90E-07	9.47E-11	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.4. Carcenogenic CDIs for the Current Industrial Worker for Nondetect Uncertainty Evaluation (Continued)

Ch	SWMU	EU	Depth	COPC	Units	EPC	Ingestion	Dermal	Inhalation	External Exposure
11	163	1	Surface	Trichloroethene	mg/kg	1.68E-01	1.64E-09	3.86E-08	5.82E-07	n/a
11	163	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
11	163	1	Surface	Vinyl chloride	mg/kg	1.68E-01	1.64E-09	3.86E-08	1.12E-06	n/a
11	219	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
11	219	1	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
11	219	1	Surface	Hexachlorobenzene	mg/kg	3.60E-01	3.52E-09	3.31E-08	7.08E-08	n/a
11	219	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
11	219	1	Surface	PCB, Total	mg/kg	5.00E+00	4.89E-08	6.44E-07	5.32E-08	n/a
11	219	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
11	219	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a
11	219	1	Surface	Uranium	mg/kg	2.00E+01	1.96E-07	9.20E-07	1.26E-10	n/a
11	488	1	Surface	3,3'-Dichlorobenzidine	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
11	488	1	Surface	Chromium	mg/kg	8.50E+01	8.32E-07	3.91E-06	5.37E-10	n/a
11	488	1	Surface	Hexachlorobenzene	mg/kg	3.70E-01	3.62E-09	3.40E-08	7.28E-08	n/a
11	488	1	Surface	Mercury	mg/kg	1.00E+01	9.78E-08	4.60E-07	1.88E-06	n/a
11	488	1	Surface	Nickel	mg/kg	6.50E+01	6.36E-07	2.39E-06	4.10E-10	n/a
11	488	1	Surface	Pentachlorophenol	mg/kg	1.80E+00	1.76E-08	1.66E-07	1.14E-11	n/a
11	488	1	Surface	Silver	mg/kg	1.00E+01	9.78E-08	3.68E-07	6.31E-11	n/a

CDI = chronic daily intake
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
1	1	Surface	Antimony	9.65E+00	0.0	0.0	n/a	0.0	35%
1	1	Surface	Hexachlorobenzene	4.40E-01	0.0	0.0	n/a	0.0	0%
1	1	Surface	Pentachlorophenol	2.20E+00	0.0	0.0	n/a	0.0	0%
1	1	Surface	Silver	3.20E+00	0.0	0.0	n/a	0.0	3%
1	1	Surface	Thallium	1.93E+01	0.0	0.0	n/a	0.0	62%
1	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
1	**1**		**Percent**		**12%**	**88%**	n/a		
1	2	Surface	Hexachlorobenzene	4.60E-01	0.0	0.0	n/a	0.0	56%
1	2	Surface	Pentachlorophenol	2.30E+00	0.0	0.0	n/a	0.0	44%
1	**2**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
1	**2**		**Percent**		**10%**	**90%**	n/a		
1	3	Surface	1,4-Dichlorobenzene	2.30E+00	0.0	0.0	0.0	0.0	0%
1	3	Surface	Antimony	1.50E+01	0.0	0.0	n/a	0.0	38%
1	3	Surface	Cadmium	3.00E+00	0.0	0.0	0.0	0.0	0%
1	3	Surface	Hexachlorobenzene	2.30E+00	0.0	0.0	n/a	0.0	1%
1	3	Surface	Hexachlorobutadiene	2.30E+00	0.0	0.0	n/a	0.0	1%
1	3	Surface	Hexachloroethane	2.30E+00	0.0	0.0	0.0	0.0	1%
1	3	Surface	Pentachlorophenol	2.30E+00	0.0	0.0	n/a	0.0	0%
1	3	Surface	Silver	4.00E+00	0.0	0.0	n/a	0.0	2%
1	3	Surface	Thallium	2.50E+01	0.0	0.0	n/a	0.0	56%
1	**3**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
1	**3**		**Percent**		**11%**	**89%**	**0%**		
1	4	Surface	Antimony	1.22E+01	0.0	0.0	n/a	0.0	43%
1	4	Surface	Cadmium	1.80E+00	0.0	0.0	0.0	0.0	0%
1	4	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
1	4	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
1	4	Surface	Thallium	1.80E+01	0.0	0.0	n/a	0.0	56%
1	**4**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
1	**4**		**Percent**		**11%**	**89%**	**0%**		
1	5	Surface	Antimony	9.75E+00	0.0	0.0	n/a	0.0	36%
1	5	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
1	5	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
1	5	Surface	Thallium	1.95E+01	0.0	0.0	n/a	0.0	64%
1	**5**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
1	**5**		**Percent**		**12%**	**88%**	n/a		
99	1	Surface	Antimony	9.72E+00	0.0	0.0	n/a	0.0	35%
99	1	Surface	Cadmium	1.94E+00	0.0	0.0	0.0	0.0	0%
99	1	Surface	Thallium	1.94E+01	0.0	0.0	n/a	0.0	62%
99	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
99	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
99	**1**		**Percent**		**12%**	**88%**	**0%**		
194	1	Surface	Hexachlorobenzene	4.30E-01	0.0	0.0	n/a	0.0	12%
194	1	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	9%
194	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	79%
194	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**1**		**Percent**		**16%**	**84%**	**0%**		
194	2	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
194	2	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	88%
194	2	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	12%
194	2	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**2**		**Percent**		**1%**	**98%**	**0%**		

SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
194	3	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
194	3	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	3	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	3	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	3	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**3**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**3**		**Percent**		**2%**	**98%**	**0%**		
194	4	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	11%
194	4	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	9%
194	4	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	80%
194	**4**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**4**		**Percent**		**16%**	**84%**	**0%**		
194	5	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	11%
194	5	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	9%
194	5	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	80%
194	**5**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**5**		**Percent**		**16%**	**84%**	**0%**		
194	6	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
194	6	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	6	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	6	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**6**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**6**		**Percent**		**2%**	**98%**	**0%**		
194	7	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
194	7	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	7	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	7	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**7**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**7**		**Percent**		**2%**	**98%**	**0%**		
194	8	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
194	8	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	81%
194	8	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
194	8	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	8	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
194	8	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
194	**8**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**8**		**Percent**		**2%**	**98%**	**0%**		
194	9	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
194	9	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	81%
194	9	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
194	9	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	9	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
194	9	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
194	**9**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**9**		**Percent**		**2%**	**98%**	**0%**		
194	10	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
194	10	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	10	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	10	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	10	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**10**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**10**		**Percent**		**2%**	**98%**	**0%**		

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
194	11	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	10%
194	11	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	8%
194	11	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	82%
194	**11**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**11**		**Percent**		**16%**	**84%**	**0%**		
194	12	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	0%
194	12	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	12	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
194	12	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**12**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**12**		**Percent**		**2%**	**98%**	**0%**		
194	13	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	0%
194	13	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	13	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	13	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	13	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**13**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**13**		**Percent**		**2%**	**98%**	**0%**		
194	14	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	1%
194	14	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	57%
194	14	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	1%
194	14	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	35%
194	14	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	7%
194	**14**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**14**		**Percent**		**2%**	**97%**	**0%**		
194	15	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	87%
194	15	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	12%
194	15	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
194	**15**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**15**		**Percent**		**2%**	**98%**	**0%**		
194	16	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
194	16	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	16	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	16	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	16	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**16**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**16**		**Percent**		**2%**	**98%**	**0%**		
194	17	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	0%
194	17	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	81%
194	17	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
194	17	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
194	17	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
194	17	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
194	**17**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**17**		**Percent**		**2%**	**98%**	**0%**		
194	18	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	0%
194	18	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	18	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	18	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	18	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**18**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**18**		**Percent**		**2%**	**98%**	**0%**		

1 = Percentage of COPC to Total
SWMU = solid waste management unit
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EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
194	19	Surface	Hexachlorobenzene	4.40E-01	0.0	0.0	n/a	0.0	0%
194	19	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	19	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
194	19	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	19	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**19**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**19**		**Percent**		**2%**	**98%**	**0%**		
194	20	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	11%
194	20	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	9%
194	20	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	80%
194	**20**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**20**		**Percent**		**16%**	**84%**	**0%**		
194	21	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	2%
194	21	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	2%
194	21	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	80%
194	21	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	16%
194	**21**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**21**		**Percent**		**4%**	**96%**	**0%**		
194	22	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
194	22	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	81%
194	22	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
194	22	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	22	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
194	22	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
194	**22**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**22**		**Percent**		**2%**	**98%**	**0%**		
194	23	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
194	23	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	23	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	23	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**23**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**23**		**Percent**		**2%**	**98%**	**0%**		
194	24	Surface	Hexachlorobenzene	4.40E-01	0.0	0.0	n/a	0.0	0%
194	24	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	24	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
194	24	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	24	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**24**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**24**		**Percent**		**2%**	**98%**	**0%**		
194	25	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
194	25	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
194	25	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	25	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
194	25	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**25**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**25**		**Percent**		**2%**	**98%**	**0%**		
194	26	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
194	26	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	86%
194	26	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	12%
194	26	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	26	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
194	**26**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	

1 = Percentage of COPC to Total
SWMU = solid waste management unit
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COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
194	**26**		**Percent**		**2%**	**98%**	**0%**		
194	27	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	0%
194	27	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	27	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
194	27	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**27**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**27**		**Percent**		**2%**	**98%**	**0%**		
194	28	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
194	28	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	28	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
194	28	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**28**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**28**		**Percent**		**2%**	**98%**	**0%**		
194	29	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	0%
194	29	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
194	29	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
194	29	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
194	**29**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**29**		**Percent**		**2%**	**98%**	**0%**		
194	30	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	11%
194	30	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	9%
194	30	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	80%
194	**30**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
194	**30**		**Percent**		**16%**	**84%**	**0%**		
194	31	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	52%
194	31	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
194	31	Surface	Hexachlorobenzene	4.70E-01	0.0	0.0	n/a	0.0	0%
194	31	Surface	Pentachlorophenol	4.70E-01	0.0	0.0	n/a	0.0	0%
194	31	Surface	Silver	4.00E+00	0.0	0.0	n/a	0.0	2%
194	31	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	45%
194	**31**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
194	**31**		**Percent**		**10%**	**90%**	**0%**		
196	1	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
196	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	92%
196	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
196	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
196	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
196	**1**		**Percent**		**1%**	**99%**	n/a		
196	2	Surface	Benzene	1.00E+00	0.0	0.0	0.0	0.0	38%
196	2	Surface	Silver	3.00E+00	0.0	0.0	n/a	0.0	62%
196	**2**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
196	**2**		**Percent**		**1%**	**67%**	**32%**		
489	1	Surface	1,2,3-Trichloropropane	5.70E-03	0.0	0.0	0.0	0.0	0%
489	1	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
489	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
489	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
489	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
489	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
489	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
489	**1**		**Percent**		**2%**	**98%**	**0%**		
531	1	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	0%
531	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	92%

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SWMU = solid waste management unit
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EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
531	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
531	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
531	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
531	**1**		**Percent**		**1%**	**99%**	n/a		
200	1	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	2%
200	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	2%
200	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
200	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
200	**1**		**Percent**		**1%**	**99%**	n/a		
212	1	Surface	Antimony	9.74E+00	0.0	0.0	n/a	0.0	17%
212	1	Surface	Cadmium	1.95E+00	0.0	0.0	0.0	0.0	0%
212	1	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	0%
212	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	49%
212	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
212	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	4%
212	1	Surface	Thallium	1.95E+01	0.0	0.0	n/a	0.0	30%
212	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
212	**1**		**Percent**		**7%**	**93%**	**0%**		
213	1	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	0%
213	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
213	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
213	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
213	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
213	**1**		**Percent**		**2%**	**98%**	**0%**		
213	2	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
213	2	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
213	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
213	**2**		**Percent**		**2%**	**98%**	**0%**		
214	1	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
214	1	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	0%
214	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	80%
214	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
214	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
214	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
214	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
214	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
214	**1**		**Percent**		**2%**	**98%**	**0%**		
215	1	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	0%
215	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
215	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
215	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
215	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
215	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
215	**1**		**Percent**		**2%**	**98%**	**0%**		
216	1	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
216	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	82%
216	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
216	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
216	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
216	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
216	**1**		**Percent**		**1%**	**99%**	**0%**		
217	1	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	0%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
217	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
217	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
217	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
217	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
217	**1**		**Percent**		**2%**	**98%**	**0%**		
217	2	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	1%
217	2	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	0%
217	2	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
217	2	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	78%
217	2	Surface	Uranium	2.00E+02	0.0	0.0	0.0	0.0	21%
217	**2**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.1**	
217	**2**		**Percent**		**18%**	**82%**	**0%**		
221	1	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	0%
221	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	92%
221	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
221	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
221	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
221	**1**		**Percent**		**1%**	**99%**	n/a		
222	1	Surface	Antimony	7.00E-01	0.0	0.0	n/a	0.0	2%
222	1	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
222	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	90%
222	1	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
222	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
222	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
222	**1**		**Percent**		**2%**	**98%**	n/a		
227	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	29%
227	1	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
227	1	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	0%
227	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	41%
227	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
227	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	3%
227	1	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	26%
227	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.2**	
227	**1**		**Percent**		**6%**	**94%**	**0%**		
227	2	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	50%
227	2	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
227	2	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	0%
227	2	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
227	2	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	6%
227	2	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	44%
227	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
227	**2**		**Percent**		**9%**	**91%**	**0%**		
228	1	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	57%
228	1	Surface	Pentachlorophenol	1.60E+00	0.0	0.0	n/a	0.0	43%
228	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
228	**1**		**Percent**		**10%**	**90%**	n/a		
76	1	Surface	Antimony	5.70E-01	0.0	0.0	n/a	0.0	2%
76	1	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
76	1	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	0%
76	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	79%
76	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
76	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
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COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
76	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
76	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
76	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
76	**1**		**Percent**		**2%**	**98%**	**0%**		
165	1	Surface	1,1-Dichloroethene	6.10E-01	0.0	0.0	0.0	0.0	0%
165	1	Surface	1,2-Dichloroethane	6.10E-01	0.0	0.0	0.0	0.0	0%
165	1	Surface	Benzene	6.10E-01	0.0	0.0	0.0	0.0	1%
165	1	Surface	Cadmium	5.00E+00	0.0	0.0	0.0	0.0	2%
165	1	Surface	Carbon tetrachloride	6.10E-01	0.0	0.0	0.0	0.0	1%
165	1	Surface	Chloroform	6.10E-01	0.0	0.0	0.0	0.0	0%
165	1	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	0%
165	1	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
165	1	Surface	Tetrachloroethene	6.10E-01	0.0	0.0	0.0	0.0	0%
165	1	Surface	Thallium	1.96E+01	0.0	0.0	n/a	0.0	90%
165	1	Surface	Trichloroethene	6.10E-01	0.0	0.0	0.0	0.0	4%
165	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
165	**1**		**Percent**		**16%**	**80%**	**4%**		
170	**1**		**Percent**						
158	1	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	2%
158	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	2%
158	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
158	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
158	**1**		**Percent**		**0.0**	**1.0**	n/a		
169	1	Surface	Cadmium	1.10E+00	0.0	0.0	0.0	0.0	3%
169	1	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	2%
169	1	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	2%
169	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	93%
169	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
169	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
19	1	Surface	Antimony	9.81E+01	0.0	0.2	n/a	0.2	88%
19	1	Surface	Chromium	2.96E+01	0.0	0.0	n/a	0.0	0%
19	1	Surface	Cobalt	4.76E+01	0.0	0.0	0.0	0.0	10%
19	1	Surface	Silver	9.90E+00	0.0	0.0	n/a	0.0	2%
19	**1**	**Surface**	**Totals**		**0.0**	**0.2**	**0.0**	**0.2**	
19	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
138	1	Surface	Hexachlorobenzene	4.30E-01	0.0	0.0	n/a	0.0	1%
138	1	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	1%
138	1	Surface	Thallium	5.00E+00	0.0	0.0	n/a	0.0	69%
138	1	Surface	Trichloroethene	1.00E+00	0.0	0.0	0.0	0.0	22%
138	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	7%
138	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
138	**1**		**Percent**		**0.1**	**0.8**	**0.1**		
138	2	Surface	1,1-Dichloroethene	1.00E+00	0.0	0.0	0.0	0.0	0%
138	2	Surface	1,2-Dichloroethane	1.00E+00	0.0	0.0	0.0	0.0	0%
138	2	Surface	Benzene	1.00E+00	0.0	0.0	0.0	0.0	1%
138	2	Surface	Carbon tetrachloride	1.00E+00	0.0	0.0	0.0	0.0	1%
138	2	Surface	Chloroform	1.00E+00	0.0	0.0	0.0	0.0	0%
138	2	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
138	2	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
138	2	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	86%
138	2	Surface	Naphthalene	2.50E+00	0.0	0.0	0.0	0.0	2%
138	2	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
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COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
138	2	Surface	Tetrachloroethene	1.00E+00	0.0	0.0	0.0	0.0	0%
138	2	Surface	Trichloroethene	1.00E+00	0.0	0.0	0.0	0.0	4%
138	2	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
138	2	Surface	Vinyl chloride	1.10E+00	0.0	0.0	0.0	0.0	1%
138	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
138	**2**		**Percent**		**0.0**	**0.9**	**0.1**		
180	1	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	2%
180	1	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	2%
180	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	80%
180	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	16%
180	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
180	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
180	2	Surface	Hexachlorobenzene	4.40E-01	0.0	0.0	n/a	0.0	0%
180	2	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
180	2	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
180	2	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
180	2	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
180	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
180	**2**		**Percent**		**0.0**	**1.0**	**0.0**		
180	3	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
180	3	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
180	3	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
180	3	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
180	**3**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
180	**3**		**Percent**		**0.0**	**1.0**	**0.0**		
180	4	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
180	4	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
180	4	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
180	4	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
180	**4**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
180	**4**		**Percent**		**0.0**	**1.0**	**0.0**		
181	1	Surface	Antimony	8.34E+00	0.0	0.0	n/a	0.0	98%
181	1	Surface	Cadmium	2.49E+00	0.0	0.0	0.0	0.0	2%
181	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
181	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
195	1	Surface	Hexachlorobenzene	4.50E-01	0.0	0.0	n/a	0.0	0%
195	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
195	1	Surface	Pentachlorophenol	2.20E+00	0.0	0.0	n/a	0.0	0%
195	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
195	2	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
195	2	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	86%
195	2	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	12%
195	2	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
195	2	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
195	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**2**		**Percent**		**0.0**	**1.0**	**0.0**		
195	3	Surface	Hexachlorobenzene	4.30E-01	0.0	0.0	n/a	0.0	0%
195	3	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	3	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
195	3	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
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COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
195	3	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**3**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**3**		**Percent**		**0.0**	**1.0**	**0.0**		
195	4	Surface	Hexachlorobenzene	4.50E-01	0.0	0.0	n/a	0.0	0%
195	4	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	90%
195	4	Surface	Pentachlorophenol	2.20E+00	0.0	0.0	n/a	0.0	0%
195	4	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	4	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**4**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**4**		**Percent**		**0.0**	**1.0**	**0.0**		
195	5	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
195	5	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	5	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
195	5	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	5	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**5**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**5**		**Percent**		**0.0**	**1.0**	**0.0**		
195	6	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
195	6	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	6	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
195	6	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	6	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**6**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**6**		**Percent**		**0.0**	**1.0**	**0.0**		
195	7	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
195	7	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	86%
195	7	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	12%
195	7	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
195	7	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
195	**7**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**7**		**Percent**		**0.0**	**1.0**	**0.0**		
195	8	Surface	Hexachlorobenzene	4.40E-01	0.0	0.0	n/a	0.0	0%
195	8	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	8	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
195	8	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	8	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**8**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**8**		**Percent**		**0.0**	**1.0**	**0.0**		
195	9	Surface	Hexachlorobenzene	4.60E-01	0.0	0.0	n/a	0.0	0%
195	9	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	90%
195	9	Surface	Pentachlorophenol	2.20E+00	0.0	0.0	n/a	0.0	0%
195	9	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	9	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**9**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**9**		**Percent**		**0.0**	**1.0**	**0.0**		
195	10	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
195	10	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	98%
195	10	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
195	10	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**10**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**10**		**Percent**		**0.0**	**1.0**	**0.0**		
195	11	Surface	Hexachlorobenzene	4.30E-01	0.0	0.0	n/a	0.0	0%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
195	11	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	11	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
195	11	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	11	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**11**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**11**		**Percent**		**0.0**	**1.0**	**0.0**		
195	12	Surface	Hexachlorobenzene	4.30E-01	0.0	0.0	n/a	0.0	0%
195	12	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	12	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
195	12	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	12	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**12**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**12**		**Percent**		**0.0**	**1.0**	**0.0**		
195	13	Surface	Hexachlorobenzene	3.90E-01	0.0	0.0	n/a	0.0	0%
195	13	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	13	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
195	13	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	13	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**13**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**13**		**Percent**		**0.0**	**1.0**	**0.0**		
195	14	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
195	14	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	14	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
195	14	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	14	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**14**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**14**		**Percent**		**0.0**	**1.0**	**0.0**		
195	15	Surface	Hexachlorobenzene	4.50E-01	0.0	0.0	n/a	0.0	0%
195	15	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	81%
195	15	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
195	15	Surface	Pentachlorophenol	2.20E+00	0.0	0.0	n/a	0.0	0%
195	15	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
195	15	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
195	**15**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**15**		**Percent**		**0.0**	**1.0**	**0.0**		
195	16	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	0%
195	16	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
195	16	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
195	16	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
195	16	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
195	**16**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
195	**16**		**Percent**		**0.0**	**1.0**	**0.0**		
195	17	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	11%
195	17	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	9%
195	17	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	80%
195	**17**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
195	**17**		**Percent**		**0.2**	**0.8**	**0.0**		
492	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	52%
492	1	Surface	Hexachlorobenzene	4.10E-01	0.0	0.0	n/a	0.0	0%
492	1	Surface	Pentachlorophenol	2.00E+00	0.0	0.0	n/a	0.0	0%
492	1	Surface	Silver	4.00E+00	0.0	0.0	n/a	0.0	2%
492	1	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	46%

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SWMU = solid waste management unit
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n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
492	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
492	**1**		**Percent**		**0.1**	**0.9**	n/a		
493	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	23%
493	1	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
493	1	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	0%
493	1	Surface	Pentachlorophenol	5.00E-01	0.0	0.0	n/a	0.0	0%
493	1	Surface	Silver	4.00E+00	0.0	0.0	n/a	0.0	1%
493	1	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	21%
493	1	Surface	Uranium	2.00E+03	0.0	0.1	0.0	0.1	55%
493	**1**	**Surface**	**Totals**		**0.0**	**0.2**	**0.0**	**0.2**	
493	**1**		**Percent**		**0.1**	**0.9**	**0.0**		
517	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	50%
517	1	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
517	1	Surface	Hexachlorobenzene	4.90E-01	0.0	0.0	n/a	0.0	0%
517	1	Surface	Pentachlorophenol	4.90E-01	0.0	0.0	n/a	0.0	0%
517	1	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	44%
517	1	Surface	Uranium	1.00E+02	0.0	0.0	0.0	0.0	6%
517	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
517	**1**		**Percent**		**0.1**	**0.9**	**0.0**		
541	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	53%
541	1	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	0%
541	1	Surface	Pentachlorophenol	5.00E-01	0.0	0.0	n/a	0.0	0%
541	1	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	47%
541	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
541	**1**		**Percent**		**0.1**	**0.9**	n/a		
561	1	Surface	Cadmium	1.83E+00	0.0	0.0	0.0	0.0	46%
561	1	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	33%
561	1	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	22%
561	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
561	**1**		**Percent**		**0.1**	**0.8**	**0.0**		
561	2	Surface	1,2,3-Trichloropropane	5.90E-03	0.0	0.0	0.0	0.0	0%
561	2	Surface	Hexachlorobenzene	4.90E-01	0.0	0.0	n/a	0.0	58%
561	2	Surface	Pentachlorophenol	2.20E+00	0.0	0.0	n/a	0.0	42%
561	**2**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
561	**2**		**Percent**		**0.1**	**0.9**	**0.0**		
562	1	Surface	Antimony	8.20E+00	0.0	0.0	n/a	0.0	81%
562	1	Surface	Chromium	6.50E+01	0.0	0.0	n/a	0.0	2%
562	1	Surface	Thallium	1.95E+00	0.0	0.0	n/a	0.0	17%
562	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
562	**1**		**Percent**		**0.1**	**0.9**	n/a		
562	2	Surface	Antimony	8.30E+00	0.0	0.0	n/a	0.0	81%
562	2	Surface	Chromium	6.50E+01	0.0	0.0	n/a	0.0	2%
562	2	Surface	Thallium	1.93E+00	0.0	0.0	n/a	0.0	17%
562	**2**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
562	**2**		**Percent**		**0.1**	**0.9**	n/a		
562	3	Surface	Antimony	7.72E+00	0.0	0.0	n/a	0.0	83%
562	3	Surface	Thallium	1.79E+00	0.0	0.0	n/a	0.0	17%
562	**3**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
562	**3**		**Percent**		**0.1**	**0.9**	n/a		
562	4	Surface	Antimony	8.13E+00	0.0	0.0	n/a	0.0	83%
562	4	Surface	Thallium	1.93E+00	0.0	0.0	n/a	0.0	17%
562	**4**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	

1 = Percentage of COPC to Total
SWMU = solid waste management unit
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EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
562	**4**		**Percent**		**0.1**	**0.9**	n/a		
562	5	Surface	Antimony	9.53E+00	0.0	0.0	n/a	0.0	85%
562	5	Surface	Thallium	1.97E+00	0.0	0.0	n/a	0.0	15%
562	**5**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
562	**5**		**Percent**		**0.1**	**0.9**	n/a		
563	1	Surface	Antimony	8.26E+00	0.0	0.0	n/a	0.0	83%
563	1	Surface	Thallium	1.96E+00	0.0	0.0	n/a	0.0	17%
563	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
563	**1**		**Percent**		**0.1**	**0.9**	n/a		
563	2	Surface	Antimony	7.85E+00	0.0	0.0	n/a	0.0	81%
563	2	Surface	Chromium	6.50E+01	0.0	0.0	n/a	0.0	2%
563	2	Surface	Thallium	1.87E+00	0.0	0.0	n/a	0.0	17%
563	**2**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
563	**2**		**Percent**		**0.1**	**0.9**	n/a		
564	1	Surface	Antimony	8.83E+00	0.0	0.0	n/a	0.0	100%
564	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
564	**1**		**Percent**		**0.0**	**1.0**	n/a		
567	1	Surface	Antimony	7.91E+00	0.0	0.0	n/a	0.0	48%
567	1	Surface	Cadmium	2.35E+00	0.0	0.0	0.0	0.0	1%
567	1	Surface	Thallium	9.38E+00	0.0	0.0	n/a	0.0	51%
567	**1**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
567	**1**		**Percent**		**0.1**	**0.9**	**0.0**		
567	2	Surface	1,1-Dichloroethene	4.00E-02	0.0	0.0	0.0	0.0	100%
567	**2**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
567	**2**		**Percent**		**0.0**	**0.0**	**1.0**		
567	3	Surface	Antimony	8.14E+00	0.0	0.0	n/a	0.0	50%
567	3	Surface	Cadmium	2.27E+00	0.0	0.0	0.0	0.0	1%
567	3	Surface	Thallium	9.08E+00	0.0	0.0	n/a	0.0	49%
567	**3**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
567	**3**		**Percent**		**0.1**	**0.9**	**0.0**		
567	4	Surface	Antimony	8.18E+00	0.0	0.0	n/a	0.0	48%
567	4	Surface	Cadmium	2.48E+00	0.0	0.0	0.0	0.0	1%
567	4	Surface	Thallium	9.93E+00	0.0	0.0	n/a	0.0	51%
567	**4**	**Surface**	**Totals**		**0.0**	**0.0**	**0.0**	**0.0**	
567	**4**		**Percent**		**0.1**	**0.9**	**0.0**		
14	1	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	0%
14	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	100%
14	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
14	**1**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
14	**1**		**Percent**		**0.0**	**1.0**	n/a		
14	2	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	2%
14	2	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	2%
14	2	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
14	**2**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**2**		**Percent**		**0.0**	**1.0**	n/a		
14	3	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	2%
14	3	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	2%
14	3	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
14	**3**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**3**		**Percent**		**0.0**	**1.0**	n/a		
14	4	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	56%
14	4	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	44%

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HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
14	**4**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**4**		**Percent**		**0.1**	**0.9**	n/a		
14	5	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	56%
14	5	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	44%
14	**5**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**5**		**Percent**		**0.1**	**0.9**	n/a		
14	6	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	57%
14	6	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	43%
14	**6**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**6**		**Percent**		**0.1**	**0.9**	n/a		
14	7	Surface	Hexachlorobenzene	4.00E-01	0.0	0.0	n/a	0.0	3%
14	7	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	2%
14	7	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	95%
14	**7**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**7**		**Percent**		**0.0**	**1.0**	n/a		
14	8	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	56%
14	8	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	44%
14	**8**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**8**		**Percent**		**0.1**	**0.9**	n/a		
14	9	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	2%
14	9	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	2%
14	9	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
14	**9**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**9**		**Percent**		**0.0**	**1.0**	n/a		
14	10	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	2%
14	10	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	2%
14	10	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
14	**10**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
14	**10**		**Percent**		**0.0**	**1.0**	n/a		
518	1	Surface	1,2,4-Trichlorobenzene	2.40E+00	0.0	0.0	0.0	0.0	0%
518	1	Surface	1,4-Dichlorobenzene	2.40E+00	0.0	0.0	0.0	0.0	0%
518	1	Surface	2,4-Dinitrotoluene	2.40E+00	0.0	0.0	n/a	0.0	0%
518	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	50%
518	1	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
518	1	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	0%
518	1	Surface	Hexachloroethane	2.40E+00	0.0	0.0	0.0	0.0	1%
518	1	Surface	Naphthalene	2.40E+00	0.0	0.0	0.0	0.0	2%
518	1	Surface	Pentachlorophenol	2.40E+00	0.0	0.0	n/a	0.0	0%
518	1	Surface	Silver	4.00E+00	0.0	0.0	n/a	0.0	2%
518	1	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	44%
518	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
518	**1**		**Percent**		**0.1**	**0.9**	**0.0**		
520	1	Surface	Antimony	9.30E+00	0.0	0.0	n/a	0.0	36%
520	1	Surface	Cadmium	1.86E+00	0.0	0.0	0.0	0.0	0%
520	1	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	0%
520	1	Surface	Pentachlorophenol	1.60E+00	0.0	0.0	n/a	0.0	0%
520	1	Surface	Thallium	1.86E+01	0.0	0.0	n/a	0.0	63%
520	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
520	**1**		**Percent**		**0.1**	**0.9**	**0.0**		
520	2	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	50%
520	2	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
520	2	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	0%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
520	2	Surface	Pentachlorophenol	1.60E+00	0.0	0.0	n/a	0.0	0%
520	2	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	6%
520	2	Surface	Thallium	2.00E+01	0.0	0.0	n/a	0.0	44%
520	**2**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
520	**2**		**Percent**		**0.1**	**0.9**	**0.0**		
520	3	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	0%
520	3	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	100%
520	3	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
520	**3**	**Surface**	**Totals**		**0.0**	**0.1**	n/a	**0.1**	
520	**3**		**Percent**		**0.0**	**1.0**	n/a		
520	4	Surface	Hexachlorobenzene	3.40E-01	0.0	0.0	n/a	0.0	56%
520	4	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	44%
520	**4**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
520	**4**		**Percent**		**0.1**	**0.9**	n/a		
520	5	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	0%
520	5	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	91%
520	5	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
520	5	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
520	5	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
520	**5**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
520	**5**		**Percent**		**0.0**	**1.0**	**0.0**		
81	1	Surface	Antimony	1.31E+01	0.0	0.0	n/a	0.0	94%
81	1	Surface	Hexachlorobenzene	4.20E-01	0.0	0.0	n/a	0.0	0%
81	1	Surface	Pentachlorophenol	2.10E+00	0.0	0.0	n/a	0.0	0%
81	1	Surface	Thallium	8.00E-01	0.0	0.0	n/a	0.0	5%
81	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
81	**1**		**Percent**		**0.0**	**1.0**	n/a		
153	1	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
153	1	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	0%
153	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	80%
153	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
153	1	Surface	Pentachlorophenol	1.90E+00	0.0	0.0	n/a	0.0	0%
153	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
153	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
153	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
153	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
156	1	Surface	Hexachlorobenzene	3.80E-01	0.0	0.0	n/a	0.0	2%
156	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	2%
156	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	96%
156	**1**	**Surface**	**Totals**		**0.0**	**0.0**	n/a	**0.0**	
156	**1**		**Percent**		**0.0**	**1.0**	n/a		
160	1	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
160	1	Surface	Hexachlorobenzene	3.50E-01	0.0	0.0	n/a	0.0	0%
160	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	80%
160	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
160	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
160	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
160	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
160	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
160	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
163	1	Surface	1,1-Dichloroethene	1.68E-01	0.0	0.0	0.0	0.0	0%
163	1	Surface	Antimony	2.00E+01	0.0	0.0	n/a	0.0	29%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.5. HIs for the Current Industrial Worker for Nondetect Uncertatinty Evaluation (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	HI	Percent[1]
163	1	Surface	Cadmium	2.00E+00	0.0	0.0	0.0	0.0	0%
163	1	Surface	Hexachlorobenzene	5.00E-01	0.0	0.0	n/a	0.0	0%
163	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	41%
163	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	6%
163	1	Surface	Pentachlorophenol	1.70E+00	0.0	0.0	n/a	0.0	0%
163	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	3%
163	1	Surface	Thallium	1.50E+01	0.0	0.0	n/a	0.0	19%
163	1	Surface	Trichloroethene	1.68E-01	0.0	0.0	0.0	0.0	0%
163	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	1%
163	1	Surface	Vinyl chloride	1.68E-01	0.0	0.0	0.0	0.0	0%
163	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.2**	
163	**1**		**Percent**		**0.1**	**0.9**	**0.0**		
219	1	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
219	1	Surface	Hexachlorobenzene	3.60E-01	0.0	0.0	n/a	0.0	0%
219	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	90%
219	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
219	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	8%
219	1	Surface	Uranium	2.00E+01	0.0	0.0	0.0	0.0	2%
219	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
219	**1**		**Percent**		**0.0**	**1.0**	**0.0**		
488	1	Surface	Chromium	8.50E+01	0.0	0.0	n/a	0.0	1%
488	1	Surface	Hexachlorobenzene	3.70E-01	0.0	0.0	n/a	0.0	0%
488	1	Surface	Mercury	1.00E+01	0.0	0.1	n/a	0.1	81%
488	1	Surface	Nickel	6.50E+01	0.0	0.0	0.0	0.0	11%
488	1	Surface	Pentachlorophenol	1.80E+00	0.0	0.0	n/a	0.0	0%
488	1	Surface	Silver	1.00E+01	0.0	0.0	n/a	0.0	7%
488	**1**	**Surface**	**Totals**		**0.0**	**0.1**	**0.0**	**0.1**	
488	**1**		**Percent**		**0.0**	**1.0**	**0.0**		

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
HI = hazard index
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
1	1	Surface	3,3'-Dichlorobenzidine	8.90E-01	3.9E-09	3.7E-08	6.7E-15	n/a	4.1E-08	4%
1	1	Surface	Bis(2-chloroethyl) ether	4.40E-01	4.7E-09	0.0E+00	3.2E-15	n/a	4.7E-09	0%
1	1	Surface	Hexachlorobenzene	4.40E-01	6.9E-09	6.5E-08	1.4E-07	n/a	2.1E-07	19%
1	1	Surface	N-Nitroso-di-n-propylamine	4.40E-01	3.0E-08	2.8E-07	1.9E-14	n/a	3.1E-07	28%
1	1	Surface	Pentachlorophenol	2.20E+00	8.6E-09	8.1E-08	2.5E-13	n/a	9.0E-08	8%
1	1	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	42%
1	**1**	**Surface**	**Totals**		**9.0E-08**	**9.0E-07**	**1.4E-07**	n/a	**1.1E-06**	
1	**1**		**Percent**		**8%**	**80%**	**12%**	n/a		
1	2	Surface	3,3'-Dichlorobenzidine	9.30E-01	4.1E-09	3.8E-08	7.0E-15	n/a	4.3E-08	4%
1	2	Surface	Bis(2-chloroethyl) ether	4.60E-01	5.0E-09	0.0E+00	3.4E-15	n/a	5.0E-09	0%
1	2	Surface	Hexachlorobenzene	4.60E-01	7.2E-09	6.8E-08	1.5E-07	n/a	2.2E-07	20%
1	2	Surface	N-Nitroso-di-n-propylamine	4.60E-01	3.2E-08	3.0E-07	2.0E-14	n/a	3.3E-07	29%
1	2	Surface	Pentachlorophenol	2.30E+00	9.0E-09	8.5E-08	2.6E-13	n/a	9.4E-08	8%
1	2	Surface	Total PAH	4.60E-01	3.3E-08	4.0E-07	6.7E-10	n/a	4.4E-07	39%
1	**2**	**Surface**	**Totals**		**9.0E-08**	**8.9E-07**	**1.5E-07**	n/a	**1.1E-06**	
1	**2**		**Percent**		**8%**	**79%**	**13%**	n/a		
1	3	Surface	1,4-Dichlorobenzene	2.30E+00	1.2E-10	0.0E+00	5.6E-16	n/a	1.2E-10	0%
1	3	Surface	Bis(2-chloroethyl) ether	3.30E-01	3.6E-09	0.0E+00	2.4E-15	n/a	3.6E-09	0%
1	3	Surface	Cadmium	3.00E+00	n/a	n/a	1.2E-10	n/a	1.2E-10	0%
1	3	Surface	Hexachlorobenzene	2.30E+00	3.6E-08	3.4E-07	7.3E-07	n/a	1.1E-06	57%
1	3	Surface	Hexachlorobutadiene	2.30E+00	1.8E-09	1.7E-08	1.1E-15	n/a	1.8E-08	1%
1	3	Surface	Hexachloroethane	2.30E+00	9.0E-10	8.5E-09	5.6E-16	n/a	9.4E-09	0%
1	3	Surface	N-Nitroso-di-n-propylamine	3.30E-01	2.3E-08	2.1E-07	1.5E-14	n/a	2.4E-07	12%
1	3	Surface	Pentachlorophenol	2.30E+00	9.0E-09	8.5E-08	2.6E-13	n/a	9.4E-08	5%
1	3	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	24%
1	**3**	**Surface**	**Totals**		**1.1E-07**	**1.1E-06**	**7.3E-07**	n/a	**1.9E-06**	
1	**3**		**Percent**		**6%**	**57%**	**38%**	n/a		
1	4	Surface	3,3'-Dichlorobenzidine	7.80E-01	3.4E-09	3.2E-08	5.9E-15	n/a	3.6E-08	3%
1	4	Surface	Bis(2-chloroethyl) ether	3.90E-01	4.2E-09	0.0E+00	2.8E-15	n/a	4.2E-09	0%
1	4	Surface	Cadmium	1.80E+00	n/a	n/a	7.2E-11	n/a	7.2E-11	0%
1	4	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	18%
1	4	Surface	N-Nitroso-di-n-propylamine	3.90E-01	2.7E-08	2.5E-07	1.7E-14	n/a	2.8E-07	27%
1	4	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	7%
1	4	Surface	Total PAH	4.80E-01	3.4E-08	4.2E-07	6.9E-10	n/a	4.5E-07	44%
1	**4**	**Surface**	**Totals**		**8.2E-08**	**8.3E-07**	**1.2E-07**	n/a	**1.0E-06**	
1	**4**		**Percent**		**8%**	**80%**	**12%**	n/a		
1	5	Surface	3,3'-Dichlorobenzidine	8.20E-01	3.6E-09	3.4E-08	6.2E-15	n/a	3.8E-08	6%
1	5	Surface	Bis(2-chloroethyl) ether	4.10E-01	4.4E-09	0.0E+00	3.0E-15	n/a	4.4E-09	1%
1	5	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	32%
1	5	Surface	N-Nitroso-di-n-propylamine	4.10E-01	2.8E-08	2.6E-07	1.8E-14	n/a	2.9E-07	47%
1	5	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	14%
1	**5**	**Surface**	**Totals**		**5.1E-08**	**4.4E-07**	**1.3E-07**	n/a	**6.2E-07**	
1	**5**		**Percent**		**8%**	**71%**	**21%**	n/a		
99	1	Surface	Cadmium	1.94E+00	n/a	n/a	7.7E-11	n/a	7.7E-11	0%
99	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	77%
99	1	Surface	Total PAH	4.80E-01	3.4E-08	4.2E-07	6.9E-10	n/a	4.5E-07	23%
99	**1**	**Surface**	**Totals**		**1.3E-07**	**1.7E-06**	**1.1E-07**	n/a	**1.9E-06**	
99	**1**		**Percent**		**7%**	**88%**	**6%**	n/a		
194	1	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
194	1	Surface	Hexachlorobenzene	4.30E-01	6.7E-09	6.3E-08	1.4E-07	n/a	2.1E-07	11%
194	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
194	1	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
194	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**1**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	2	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	2	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
194	2	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%

SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
194	2	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	2	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**2**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**2**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	3	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	3	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
194	3	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	3	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**3**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**3**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	4	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	4	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
194	4	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	4	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**4**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**4**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	5	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	5	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
194	5	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	5	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**5**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**5**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	6	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	6	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
194	6	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	6	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**6**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**6**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	7	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	7	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	10%
194	7	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	7	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**7**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**7**		**Percent**		**7%**	**81%**	**12%**	n/a		
194	8	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	8	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
194	8	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	8	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	8	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**8**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**8**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	9	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	9	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
194	9	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	9	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	9	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**9**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**9**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	10	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	10	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	10%
194	10	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	10	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**10**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**10**		**Percent**		**7%**	**81%**	**12%**	n/a		
194	11	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	24%
194	11	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	54%
194	11	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
194	**11**	**Surface**	**Totals**		**2.0E-08**	**1.9E-07**	**1.1E-07**	n/a	**3.2E-07**	
194	**11**		**Percent**		**6%**	**58%**	**36%**	n/a		
194	12	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
194	12	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	9%
194	12	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
194	12	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
194	**12**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
194	**12**		**Percent**		**7%**	**81%**	**12%**	n/a		
194	13	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	13	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	10%
194	13	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	13	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**13**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**13**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	14	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	14	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	10%
194	14	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	14	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	14	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**14**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**14**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	15	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	15	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	100%
194	**15**	**Surface**	**Totals**		**9.8E-08**	**1.3E-06**	**1.1E-07**	n/a	**1.5E-06**	
194	**15**		**Percent**		**7%**	**86%**	**7%**	n/a		
194	16	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	16	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
194	16	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	16	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**16**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**16**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	17	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
194	17	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	10%
194	17	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	17	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
194	17	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
194	**17**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
194	**17**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	18	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	18	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	10%
194	18	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	18	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**18**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.9E-06**	
194	**18**		**Percent**		**7%**	**81%**	**13%**	n/a		
194	19	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
194	19	Surface	Hexachlorobenzene	4.40E-01	6.9E-09	6.5E-08	1.4E-07	n/a	2.1E-07	11%
194	19	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
194	19	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
194	**19**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
194	**19**		**Percent**		**6%**	**80%**	**13%**	n/a		
194	20	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	20	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
194	20	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	20	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**20**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**20**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	21	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
194	21	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
194	21	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	21	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**21**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**21**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	22	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	25%
194	22	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	53%
194	22	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	22	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	22%
194	**22**	**Surface**	**Totals**		**2.2E-08**	**2.0E-07**	**1.2E-07**	n/a	**3.5E-07**	
194	**22**		**Percent**		**6%**	**59%**	**35%**	n/a		
194	23	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	23	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
194	23	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	23	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**23**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**23**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	24	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
194	24	Surface	Hexachlorobenzene	4.40E-01	6.9E-09	6.5E-08	1.4E-07	n/a	2.1E-07	11%
194	24	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
194	24	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
194	**24**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
194	**24**		**Percent**		**6%**	**80%**	**13%**	n/a		
194	25	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	25	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
194	25	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	25	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**25**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
194	**25**		**Percent**		**6%**	**81%**	**13%**	n/a		
194	26	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	26	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
194	26	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
194	26	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	26	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**26**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**26**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	27	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	27	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	10%
194	27	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
194	27	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**27**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.9E-06**	
194	**27**		**Percent**		**7%**	**81%**	**13%**	n/a		
194	28	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
194	28	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
194	28	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
194	28	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
194	**28**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
194	**28**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	29	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	5%
194	29	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	10%
194	29	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
194	29	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
194	**29**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
194	**29**		**Percent**		**6%**	**81%**	**12%**	n/a		
194	30	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
194	30	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	10%
194	30	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
194	30	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
194	**30**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.9E-06**	
194	**30**		**Percent**		**7%**	**81%**	**13%**	n/a		
194	31	Surface	3,3'-Dichlorobenzidine	4.70E-01	2.1E-09	1.9E-08	3.5E-15	n/a	2.2E-08	2%
194	31	Surface	Bis(2-chloroethyl) ether	4.70E-01	5.1E-09	0.0E+00	3.4E-15	n/a	5.1E-09	0%
194	31	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
194	31	Surface	Hexachlorobenzene	4.70E-01	7.4E-09	6.9E-08	1.5E-07	n/a	2.3E-07	21%
194	31	Surface	N-Nitroso-di-n-propylamine	4.70E-01	3.2E-08	3.0E-07	2.1E-14	n/a	3.3E-07	31%
194	31	Surface	PCB, Total	1.00E-01	2.0E-09	2.6E-08	2.1E-09	n/a	3.0E-08	3%
194	31	Surface	Pentachlorophenol	4.70E-01	1.8E-09	1.7E-08	5.3E-14	n/a	1.9E-08	2%
194	31	Surface	Total PAH	4.70E-01	3.4E-08	4.1E-07	6.8E-10	n/a	4.4E-07	41%
194	**31**	**Surface**	**Totals**		**8.4E-08**	**8.4E-07**	**1.5E-07**	n/a	**1.1E-06**	
194	**31**		**Percent**		**8%**	**78%**	**14%**	n/a		
196	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	5%
196	1	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	10%
196	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
196	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
196	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
196	**1**		**Percent**		**6%**	**81%**	**12%**	n/a		
196	2	Surface	Benzene	1.00E+00	5.4E-10	1.3E-08	6.7E-08	n/a	8.0E-08	100%
196	**2**	**Surface**	**Totals**		**5.4E-10**	**1.3E-08**	**6.7E-08**	n/a	**8.0E-08**	
196	**2**		**Percent**		**1%**	**16%**	**84%**	n/a		
489	1	Surface	1,2,3-Trichloropropane	5.70E-03	1.7E-09	0.0E+00	n/a	n/a	1.7E-09	0%
489	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	5%
489	1	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	10%
489	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
489	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
489	1	Surface	Trans-1,4-Dichloro-2-butene	1.10E-02	n/a	n/a	1.0E-15	n/a	1.0E-15	0%
489	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
489	**1**		**Percent**		**7%**	**81%**	**12%**	n/a		
531	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
531	1	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	9%
531	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
531	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
531	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
531	**1**		**Percent**		**7%**	**81%**	**12%**	n/a		
200	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	25%
200	1	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	53%
200	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	22%
200	**1**	**Surface**	**Totals**		**2.1E-08**	**2.0E-07**	**1.2E-07**	n/a	**3.3E-07**	
200	**1**		**Percent**		**6%**	**59%**	**35%**	n/a		
212	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	8%
212	1	Surface	Bis(2-chloroethyl) ether	3.30E-01	3.6E-09	0.0E+00	2.4E-15	n/a	3.6E-09	0%
212	1	Surface	Cadmium	1.95E+00	n/a	n/a	7.8E-11	n/a	7.8E-11	0%
212	1	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	16%
212	1	Surface	N-Nitroso-di-n-propylamine	3.30E-01	2.3E-08	2.1E-07	1.5E-14	n/a	2.4E-07	23%
212	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	7%
212	1	Surface	Total PAH	4.90E-01	3.5E-08	4.3E-07	7.1E-10	n/a	4.6E-07	46%
212	**1**	**Surface**	**Totals**		**8.1E-08**	**8.2E-07**	**1.1E-07**	n/a	**1.0E-06**	
212	**1**		**Percent**		**8%**	**81%**	**11%**	n/a		
213	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
213	1	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	53%
213	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
213	**1**	**Surface**	**Totals**		**1.9E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
213	**1**		**Percent**		**6%**	**59%**	**35%**	n/a		
213	2	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	100%
213	**2**	**Surface**	**Totals**		**9.8E-08**	**1.3E-06**	**1.1E-07**	n/a	**1.5E-06**	

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
213	**2**		**Percent**		**7%**	**86%**	**7%**	n/a		
214	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	4%
214	1	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	8%
214	1	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	9%
214	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
214	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	75%
214	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
214	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**3.8E-07**	n/a	**2.0E-06**	
214	**1**		**Percent**		**6%**	**75%**	**19%**	n/a		
215	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
215	1	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	9%
215	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
215	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
215	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
215	**1**		**Percent**		**7%**	**81%**	**12%**	n/a		
216	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	5%
216	1	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	10%
216	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
216	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
216	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
216	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
216	**1**		**Percent**		**6%**	**81%**	**12%**	n/a		
217	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
217	1	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	10%
217	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
217	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
217	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
217	**1**		**Percent**		**6%**	**81%**	**12%**	n/a		
217	2	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
217	2	Surface	Bis(2-chloroethyl) ether	3.70E-01	4.0E-09	0.0E+00	2.7E-15	n/a	4.0E-09	0%
217	2	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
217	2	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	8%
217	2	Surface	N-Nitroso-di-n-propylamine	3.70E-01	2.5E-08	2.4E-07	1.6E-14	n/a	2.6E-07	13%
217	2	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	71%
217	2	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
217	**2**	**Surface**	**Totals**		**1.5E-07**	**1.7E-06**	**2.2E-07**	n/a	**2.1E-06**	
217	**2**		**Percent**		**7%**	**82%**	**11%**	n/a		
221	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
221	1	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	53%
221	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
221	**1**	**Surface**	**Totals**		**2.0E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
221	**1**		**Percent**		**6%**	**59%**	**35%**	n/a		
222	1	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	25%
222	1	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	53%
222	1	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	22%
222	**1**	**Surface**	**Totals**		**2.3E-08**	**2.2E-07**	**1.3E-07**	n/a	**3.7E-07**	
222	**1**		**Percent**		**6%**	**59%**	**35%**	n/a		
227	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	10%
227	1	Surface	Bis(2-chloroethyl) ether	5.00E-01	5.4E-09	0.0E+00	3.6E-15	n/a	5.4E-09	1%
227	1	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
227	1	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	32%
227	1	Surface	N-Nitroso-di-n-propylamine	5.00E-01	3.4E-08	3.2E-07	2.2E-14	n/a	3.6E-07	48%
227	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	9%
227	**1**	**Surface**	**Totals**		**6.2E-08**	**5.3E-07**	**1.6E-07**	n/a	**7.5E-07**	
227	**1**		**Percent**		**8%**	**71%**	**21%**	n/a		
227	2	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	12%
227	2	Surface	Bis(2-chloroethyl) ether	4.80E-01	5.2E-09	0.0E+00	3.5E-15	n/a	5.2E-09	1%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
227	2	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
227	2	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	25%
227	2	Surface	N-Nitroso-di-n-propylamine	4.80E-01	3.3E-08	3.1E-07	2.1E-14	n/a	3.4E-07	52%
227	2	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	11%
227	**2**	**Surface**	**Totals**		**5.8E-08**	**4.9E-07**	**1.1E-07**	n/a	**6.6E-07**	
227	**2**		**Percent**		**9%**	**75%**	**16%**	n/a		
228	1	Surface	3,3'-Dichlorobenzidine	1.60E+00	7.0E-09	6.6E-08	1.2E-14	n/a	7.3E-08	4%
228	1	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	9%
228	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
228	1	Surface	Pentachlorophenol	1.60E+00	6.3E-09	5.9E-08	1.8E-13	n/a	6.5E-08	4%
228	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.1E-07**	n/a	**1.8E-06**	
228	**1**		**Percent**		**6%**	**82%**	**12%**	n/a		
76	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	17%
76	1	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	32%
76	1	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	35%
76	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
76	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	15%
76	**1**	**Surface**	**Totals**		**2.1E-08**	**1.9E-07**	**2.7E-07**	n/a	**4.9E-07**	
76	**1**		**Percent**		**4%**	**40%**	**56%**	n/a		
165	1	Surface	1,1-Dichloroethene	6.10E-01	3.6E-09	8.4E-08	6.1E-07	n/a	7.0E-07	30%
165	1	Surface	1,2-Dichloroethane	6.10E-01	5.4E-10	0.0E+00	3.5E-16	n/a	5.4E-10	0%
165	1	Surface	3,3'-Dichlorobenzidine	7.50E-01	3.3E-09	3.1E-08	5.6E-15	n/a	3.4E-08	1%
165	1	Surface	Benzene	6.10E-01	3.3E-10	7.7E-09	4.1E-08	n/a	4.9E-08	2%
165	1	Surface	Bis(2-chloroethyl) ether	3.70E-01	4.0E-09	0.0E+00	2.7E-15	n/a	4.0E-09	0%
165	1	Surface	Cadmium	5.00E+00	n/a	n/a	2.0E-10	n/a	2.0E-10	0%
165	1	Surface	Carbon tetrachloride	6.10E-01	4.2E-10	9.8E-09	5.9E-08	n/a	6.9E-08	3%
165	1	Surface	Chloroform	6.10E-01	1.9E-10	4.3E-09	1.4E-07	n/a	1.4E-07	6%
165	1	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	8%
165	1	Surface	N-Nitroso-di-n-propylamine	3.70E-01	2.5E-08	2.4E-07	1.6E-14	n/a	2.6E-07	11%
165	1	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	3%
165	1	Surface	Tetrachloroethene	6.10E-01	3.2E-09	7.6E-08	4.2E-08	n/a	1.2E-07	5%
165	1	Surface	Trichloroethene	6.10E-01	1.9E-09	4.5E-08	6.8E-07	n/a	7.3E-07	31%
165	**1**	**Surface**	**Totals**		**5.6E-08**	**6.2E-07**	**1.7E-06**	n/a	**2.4E-06**	
165	**1**		**Percent**		**2%**	**26%**	**71%**	n/a		
170	1	Surface	PCB, Total	1.00E-01	2.0E-09	2.6E-08	2.1E-09	n/a	3.0E-08	100%
170	**1**	**Surface**	**Totals**		**2.0E-09**	**2.6E-08**	**2.1E-09**	n/a	**3.0E-08**	
170	**1**		**Percent**		**7%**	**86%**	**7%**	n/a		
158	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	5%
158	1	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	10%
158	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
158	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
158	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
158	**1**		**Percent**		**6%**	**81%**	**12%**	n/a		
169	1	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	25%
169	1	Surface	Cadmium	1.10E+00	n/a	n/a	4.4E-11	n/a	4.4E-11	0%
169	1	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	53%
169	1	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	22%
169	**1**	**Surface**	**Totals**		**2.2E-08**	**2.0E-07**	**1.2E-07**	n/a	**3.5E-07**	
169	**1**		**Percent**		**6%**	**59%**	**35%**	n/a		
19	1	Surface	Chromium	2.96E+01	n/a	n/a	5.5E-08	n/a	5.5E-08	85%
19	1	Surface	Cobalt	4.76E+01	n/a	n/a	9.5E-09	n/a	9.5E-09	15%
19	**1**	**Surface**	**Totals**		n/a	n/a	**6.4E-08**	n/a	**6.4E-08**	
19	**1**		**Percent**		n/a	n/a	**1.0E+00**	n/a		
138	1	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	6%
138	1	Surface	Hexachlorobenzene	4.30E-01	6.7E-09	6.3E-08	1.4E-07	n/a	2.1E-07	13%
138	1	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
138	1	Surface	Trichloroethene	1.00E+00	3.2E-09	7.4E-08	1.1E-06	n/a	1.2E-06	75%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
138	**1**	**Surface**	**Totals**		**2.7E-08**	**3.0E-07**	**1.3E-06**	n/a	**1.6E-06**	
138	**1**		**Percent**		**1.7E-02**	**1.9E-01**	**7.9E-01**	n/a		
138	2	Surface	1,1-Dichloroethene	1.00E+00	5.9E-09	1.4E-07	1.0E-06	n/a	1.1E-06	30%
138	2	Surface	1,2-Dichloroethane	1.00E+00	8.9E-10	0.0E+00	5.7E-16	n/a	8.9E-10	0%
138	2	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	2%
138	2	Surface	Benzene	1.00E+00	5.4E-10	1.3E-08	6.7E-08	n/a	8.0E-08	2%
138	2	Surface	Carbon tetrachloride	1.00E+00	6.8E-10	1.6E-08	9.6E-08	n/a	1.1E-07	3%
138	2	Surface	Chloroform	1.00E+00	3.0E-10	7.1E-09	2.3E-07	n/a	2.3E-07	6%
138	2	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	4%
138	2	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	5%
138	2	Surface	Naphthalene	2.50E+00	n/a	n/a	6.3E-08	n/a	6.3E-08	2%
138	2	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	2%
138	2	Surface	Tetrachloroethene	1.00E+00	5.3E-09	1.2E-07	6.9E-08	n/a	2.0E-07	5%
138	2	Surface	Trichloroethene	1.00E+00	3.2E-09	7.4E-08	1.1E-06	n/a	1.2E-06	31%
138	2	Surface	Vinyl chloride	1.10E+00	7.7E-09	1.8E-07	1.1E-07	n/a	3.0E-07	8%
138	**2**	**Surface**	**Totals**		**4.5E-08**	**7.5E-07**	**3.0E-06**	n/a	**3.8E-06**	
138	**2**		**Percent**		**1.2E-02**	**2.0E-01**	**7.9E-01**	n/a		
180	1	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
180	1	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
180	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
180	1	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
180	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
180	**1**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
180	2	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
180	2	Surface	Hexachlorobenzene	4.40E-01	6.9E-09	6.5E-08	1.4E-07	n/a	2.1E-07	11%
180	2	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
180	2	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
180	**2**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
180	**2**		**Percent**		**6.5E-02**	**8.0E-01**	**1.3E-01**	n/a		
180	3	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
180	3	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
180	3	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
180	3	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
180	**3**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
180	**3**		**Percent**		**6.5E-02**	**8.1E-01**	**1.2E-01**	n/a		
180	4	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
180	4	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
180	4	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
180	4	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
180	**4**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
180	**4**		**Percent**		**6.5E-02**	**8.1E-01**	**1.2E-01**	n/a		
181	1	Surface	Cadmium	2.49E+00	n/a	n/a	9.9E-11	n/a	9.9E-11	0%
181	1	Surface	PCB, Total	1.30E-01	2.5E-09	3.3E-08	2.8E-09	n/a	3.9E-08	100%
181	**1**	**Surface**	**Totals**		**2.5E-09**	**3.3E-08**	**2.9E-09**	n/a	**3.9E-08**	
181	**1**		**Percent**		**6.5E-02**	**8.6E-01**	**7.4E-02**	n/a		
195	1	Surface	3,3'-Dichlorobenzidine	2.20E+00	9.7E-09	9.1E-08	1.7E-14	n/a	1.0E-07	5%
195	1	Surface	Hexachlorobenzene	4.50E-01	7.0E-09	6.6E-08	1.4E-07	n/a	2.2E-07	11%
195	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	1	Surface	Pentachlorophenol	2.20E+00	8.6E-09	8.1E-08	2.5E-13	n/a	9.0E-08	5%
195	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
195	**1**		**Percent**		**6.5E-02**	**8.0E-01**	**1.3E-01**	n/a		
195	2	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
195	2	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	11%
195	2	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
195	2	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
195	2	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
195	**2**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
195	**2**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	3	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
195	3	Surface	Hexachlorobenzene	4.30E-01	6.7E-09	6.3E-08	1.4E-07	n/a	2.1E-07	11%
195	3	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	3	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
195	**3**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**3**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	4	Surface	3,3'-Dichlorobenzidine	2.20E+00	9.7E-09	9.1E-08	1.7E-14	n/a	1.0E-07	5%
195	4	Surface	Hexachlorobenzene	4.50E-01	7.0E-09	6.6E-08	1.4E-07	n/a	2.2E-07	11%
195	4	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	4	Surface	Pentachlorophenol	2.20E+00	8.6E-09	8.1E-08	2.5E-13	n/a	9.0E-08	5%
195	**4**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
195	**4**		**Percent**		**6.5E-02**	**8.0E-01**	**1.3E-01**	n/a		
195	5	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
195	5	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
195	5	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
195	5	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
195	**5**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**5**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	6	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
195	6	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
195	6	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
195	6	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
195	**6**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**6**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	7	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
195	7	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
195	7	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
195	7	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
195	7	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
195	**7**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**7**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	8	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
195	8	Surface	Hexachlorobenzene	4.40E-01	6.9E-09	6.5E-08	1.4E-07	n/a	2.1E-07	11%
195	8	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	8	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
195	**8**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
195	**8**		**Percent**		**6.5E-02**	**8.0E-01**	**1.3E-01**	n/a		
195	9	Surface	3,3'-Dichlorobenzidine	2.20E+00	9.7E-09	9.1E-08	1.7E-14	n/a	1.0E-07	5%
195	9	Surface	Hexachlorobenzene	4.60E-01	7.2E-09	6.8E-08	1.5E-07	n/a	2.2E-07	12%
195	9	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	78%
195	9	Surface	Pentachlorophenol	2.20E+00	8.6E-09	8.1E-08	2.5E-13	n/a	9.0E-08	5%
195	**9**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
195	**9**		**Percent**		**6.5E-02**	**8.0E-01**	**1.3E-01**	n/a		
195	10	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
195	10	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
195	10	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
195	10	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
195	**10**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**10**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	11	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%
195	11	Surface	Hexachlorobenzene	4.30E-01	6.7E-09	6.3E-08	1.4E-07	n/a	2.1E-07	11%
195	11	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	11	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
195	**11**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**11**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	12	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	5%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
195	12	Surface	Hexachlorobenzene	4.30E-01	6.7E-09	6.3E-08	1.4E-07	n/a	2.1E-07	11%
195	12	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	12	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	5%
195	**12**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**12**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	13	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
195	13	Surface	Hexachlorobenzene	3.90E-01	6.1E-09	5.7E-08	1.2E-07	n/a	1.9E-07	10%
195	13	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
195	13	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
195	**13**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
195	**13**		**Percent**		**6.5E-02**	**8.1E-01**	**1.2E-01**	n/a		
195	14	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	5%
195	14	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	11%
195	14	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	80%
195	14	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	4%
195	**14**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.4E-07**	n/a	**1.9E-06**	
195	**14**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	15	Surface	3,3'-Dichlorobenzidine	2.20E+00	9.7E-09	9.1E-08	1.7E-14	n/a	1.0E-07	5%
195	15	Surface	Hexachlorobenzene	4.50E-01	7.0E-09	6.6E-08	1.4E-07	n/a	2.2E-07	11%
195	15	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
195	15	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	79%
195	15	Surface	Pentachlorophenol	2.20E+00	8.6E-09	8.1E-08	2.5E-13	n/a	9.0E-08	5%
195	**15**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.5E-07**	n/a	**1.9E-06**	
195	**15**		**Percent**		**6.5E-02**	**8.0E-01**	**1.3E-01**	n/a		
195	16	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	5%
195	16	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	10%
195	16	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	81%
195	16	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	4%
195	**16**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.3E-07**	n/a	**1.8E-06**	
195	**16**		**Percent**		**6.5E-02**	**8.1E-01**	**1.3E-01**	n/a		
195	17	Surface	3,3'-Dichlorobenzidine	2.00E+00	8.8E-09	8.3E-08	1.5E-14	n/a	9.2E-08	25%
195	17	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	53%
195	17	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	22%
195	**17**	**Surface**	**Totals**		**2.3E-08**	**2.2E-07**	**1.3E-07**	n/a	**3.7E-07**	
195	**17**		**Percent**		**6.2E-02**	**5.9E-01**	**3.5E-01**	n/a		
492	1	Surface	3,3'-Dichlorobenzidine	8.20E-01	3.6E-09	3.4E-08	6.2E-15	n/a	3.8E-08	3%
492	1	Surface	Bis(2-chloroethyl) ether	4.10E-01	4.4E-09	0.0E+00	3.0E-15	n/a	4.4E-09	0%
492	1	Surface	Hexachlorobenzene	4.10E-01	6.4E-09	6.0E-08	1.3E-07	n/a	2.0E-07	18%
492	1	Surface	N-Nitroso-di-n-propylamine	4.10E-01	2.8E-08	2.6E-07	1.8E-14	n/a	2.9E-07	27%
492	1	Surface	Pentachlorophenol	2.00E+00	7.8E-09	7.4E-08	2.3E-13	n/a	8.1E-08	8%
492	1	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	44%
492	**1**	**Surface**	**Totals**		**8.6E-08**	**8.7E-07**	**1.3E-07**	n/a	**1.1E-06**	
492	**1**		**Percent**		**7.9E-02**	**8.0E-01**	**1.2E-01**	n/a		
493	1	Surface	3,3'-Dichlorobenzidine	5.00E-01	2.2E-09	2.1E-08	3.8E-15	n/a	2.3E-08	4%
493	1	Surface	Bis(2-chloroethyl) ether	5.00E-01	5.4E-09	0.0E+00	3.6E-15	n/a	5.4E-09	1%
493	1	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
493	1	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	37%
493	1	Surface	N-Nitroso-di-n-propylamine	5.00E-01	3.4E-08	3.2E-07	2.2E-14	n/a	3.6E-07	55%
493	1	Surface	Pentachlorophenol	5.00E-01	2.0E-09	1.8E-08	5.6E-14	n/a	2.0E-08	3%
493	**1**	**Surface**	**Totals**		**5.2E-08**	**4.3E-07**	**1.6E-07**	n/a	**6.4E-07**	
493	**1**		**Percent**		**8.0E-02**	**6.7E-01**	**2.5E-01**	n/a		
517	1	Surface	3,3'-Dichlorobenzidine	4.90E-01	2.2E-09	2.0E-08	3.7E-15	n/a	2.2E-08	2%
517	1	Surface	Bis(2-chloroethyl) ether	4.90E-01	5.3E-09	0.0E+00	3.6E-15	n/a	5.3E-09	0%
517	1	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
517	1	Surface	Hexachlorobenzene	4.90E-01	7.7E-09	7.2E-08	1.6E-07	n/a	2.3E-07	21%
517	1	Surface	N-Nitroso-di-n-propylamine	4.90E-01	3.4E-08	3.2E-07	2.2E-14	n/a	3.5E-07	32%
517	1	Surface	Pentachlorophenol	4.90E-01	1.9E-09	1.8E-08	5.5E-14	n/a	2.0E-08	2%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
517	1	Surface	Total PAH	4.90E-01	3.5E-08	4.3E-07	7.1E-10	n/a	4.6E-07	42%
517	**1**	**Surface**	**Totals**		**8.6E-08**	**8.5E-07**	**1.6E-07**	n/a	**1.1E-06**	
517	**1**		**Percent**		**7.8E-02**	**7.8E-01**	**1.4E-01**	n/a		
541	1	Surface	3,3'-Dichlorobenzidine	5.00E-01	2.2E-09	2.1E-08	3.8E-15	n/a	2.3E-08	4%
541	1	Surface	Bis(2-chloroethyl) ether	5.00E-01	5.4E-09	0.0E+00	3.6E-15	n/a	5.4E-09	1%
541	1	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	37%
541	1	Surface	N-Nitroso-di-n-propylamine	5.00E-01	3.4E-08	3.2E-07	2.2E-14	n/a	3.6E-07	55%
541	1	Surface	Pentachlorophenol	5.00E-01	2.0E-09	1.8E-08	5.6E-14	n/a	2.0E-08	3%
541	**1**	**Surface**	**Totals**		**5.2E-08**	**4.3E-07**	**1.6E-07**	n/a	**6.4E-07**	
541	**1**		**Percent**		**8.0E-02**	**6.7E-01**	**2.5E-01**	n/a		
561	1	Surface	3,3'-Dichlorobenzidine	2.10E+00	9.2E-09	8.7E-08	1.6E-14	n/a	9.6E-08	13%
561	1	Surface	Bis(2-chloroethyl) ether	4.40E-01	4.7E-09	0.0E+00	3.2E-15	n/a	4.7E-09	1%
561	1	Surface	Cadmium	1.83E+00	n/a	n/a	7.3E-11	n/a	7.3E-11	0%
561	1	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	32%
561	1	Surface	N-Nitroso-di-n-propylamine	4.40E-01	3.0E-08	2.8E-07	1.9E-14	n/a	3.1E-07	42%
561	1	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	12%
561	**1**	**Surface**	**Totals**		**6.0E-08**	**5.2E-07**	**1.6E-07**	n/a	**7.4E-07**	
561	**1**		**Percent**		**8.1E-02**	**7.0E-01**	**2.1E-01**	n/a		
561	2	Surface	1,2,3-Trichloropropane	5.90E-03	1.7E-09	0.0E+00	n/a	n/a	1.7E-09	0%
561	2	Surface	3,3'-Dichlorobenzidine	2.20E+00	9.7E-09	9.1E-08	1.7E-14	n/a	1.0E-07	14%
561	2	Surface	Bis(2-chloroethyl) ether	4.40E-01	4.7E-09	0.0E+00	3.2E-15	n/a	4.7E-09	1%
561	2	Surface	Hexachlorobenzene	4.90E-01	7.7E-09	7.2E-08	1.6E-07	n/a	2.3E-07	32%
561	2	Surface	N-Nitroso-di-n-propylamine	4.40E-01	3.0E-08	2.8E-07	1.9E-14	n/a	3.1E-07	42%
561	2	Surface	Pentachlorophenol	2.20E+00	8.6E-09	8.1E-08	2.5E-13	n/a	9.0E-08	12%
561	2	Surface	Trans-1,4-Dichloro-2-butene	1.20E-02	n/a	n/a	1.1E-15	n/a	1.1E-15	0%
561	**2**	**Surface**	**Totals**		**6.3E-08**	**5.3E-07**	**1.6E-07**	n/a	**7.5E-07**	
561	**2**		**Percent**		**8.4E-02**	**7.1E-01**	**2.1E-01**	n/a		
562	1	Surface	Chromium	6.50E+01	n/a	n/a	1.2E-07	n/a	1.2E-07	14%
562	1	Surface	PCB, Total	1.00E+00	2.0E-08	2.6E-07	2.1E-08	n/a	3.0E-07	34%
562	1	Surface	Total PAH	4.90E-01	3.5E-08	4.3E-07	7.1E-10	n/a	4.6E-07	53%
562	**1**	**Surface**	**Totals**		**5.5E-08**	**6.9E-07**	**1.4E-07**	n/a	**8.8E-07**	
562	**1**		**Percent**		**6.2E-02**	**7.8E-01**	**1.6E-01**	n/a		
562	2	Surface	Chromium	6.50E+01	n/a	n/a	1.2E-07	n/a	1.2E-07	20%
562	2	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	80%
562	**2**	**Surface**	**Totals**		**3.6E-08**	**4.4E-07**	**1.2E-07**	n/a	**5.9E-07**	
562	**2**		**Percent**		**6.0E-02**	**7.4E-01**	**2.0E-01**	n/a		
562	4	Surface	PCB, Total	1.00E+00	2.0E-08	2.6E-07	2.1E-08	n/a	3.0E-07	39%
562	4	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	61%
562	**4**	**Surface**	**Totals**		**5.5E-08**	**6.9E-07**	**2.2E-08**	n/a	**7.7E-07**	
562	**4**		**Percent**		**7.2E-02**	**9.0E-01**	**2.9E-02**	n/a		
562	**5**		**Percent**		n/a	n/a	n/a	n/a		
563	1	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	100%
563	**1**	**Surface**	**Totals**		**3.6E-08**	**4.4E-07**	**7.2E-10**	n/a	**4.7E-07**	
563	**1**		**Percent**		**7.6E-02**	**9.2E-01**	**1.5E-03**	n/a		
563	2	Surface	Chromium	6.50E+01	n/a	n/a	1.2E-07	n/a	1.2E-07	14%
563	2	Surface	PCB, Total	1.00E+00	2.0E-08	2.6E-07	2.1E-08	n/a	3.0E-07	33%
563	2	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	53%
563	**2**	**Surface**	**Totals**		**5.5E-08**	**6.9E-07**	**1.4E-07**	n/a	**8.9E-07**	
563	**2**		**Percent**		**6.2E-02**	**7.8E-01**	**1.6E-01**	n/a		
564	1	Surface	Total PAH	4.90E-01	3.5E-08	4.3E-07	7.1E-10	n/a	4.6E-07	100%
564	**1**	**Surface**	**Totals**		**3.5E-08**	**4.3E-07**	**7.1E-10**	n/a	**4.6E-07**	
564	**1**		**Percent**		**7.6E-02**	**9.2E-01**	**1.5E-03**	n/a		
567	1	Surface	Cadmium	2.35E+00	n/a	n/a	9.3E-11	n/a	9.3E-11	0%
567	1	Surface	PCB, Total	1.30E-01	2.5E-09	3.3E-08	2.8E-09	n/a	3.9E-08	8%
567	1	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	92%
567	**1**	**Surface**	**Totals**		**3.8E-08**	**4.7E-07**	**3.6E-09**	n/a	**5.1E-07**	
567	**1**		**Percent**		**7.5E-02**	**9.2E-01**	**7.0E-03**	n/a		

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
567	2	Surface	1,1-Dichloroethene	4.00E-02	2.3E-10	5.5E-09	4.0E-08	n/a	4.6E-08	100%
567	**2**	**Surface**	**Totals**		**2.3E-10**	**5.5E-09**	**4.0E-08**	n/a	**4.6E-08**	
567	**2**		**Percent**		**5.1E-03**	**1.2E-01**	**8.7E-01**	n/a		
567	3	Surface	Cadmium	2.27E+00	n/a	n/a	9.0E-11	n/a	9.0E-11	0%
567	3	Surface	PCB, Total	1.30E-01	2.5E-09	3.3E-08	2.8E-09	n/a	3.9E-08	8%
567	3	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	92%
567	**3**	**Surface**	**Totals**		**3.8E-08**	**4.7E-07**	**3.6E-09**	n/a	**5.1E-07**	
567	**3**		**Percent**		**7.5E-02**	**9.2E-01**	**7.0E-03**	n/a		
567	4	Surface	Cadmium	2.48E+00	n/a	n/a	9.9E-11	n/a	9.9E-11	0%
567	4	Surface	PCB, Total	1.30E-01	2.5E-09	3.3E-08	2.8E-09	n/a	3.9E-08	8%
567	4	Surface	Total PAH	5.00E-01	3.6E-08	4.4E-07	7.2E-10	n/a	4.7E-07	92%
567	**4**	**Surface**	**Totals**		**3.8E-08**	**4.7E-07**	**3.6E-09**	n/a	**5.1E-07**	
567	**4**		**Percent**		**7.5E-02**	**9.2E-01**	**7.0E-03**	n/a		
14	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
14	1	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	53%
14	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**1**	**Surface**	**Totals**		**1.9E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
14	**1**		**Percent**		**6.3E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	2	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
14	2	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	53%
14	2	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**2**	**Surface**	**Totals**		**1.9E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
14	**2**		**Percent**		**6.3E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	3	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
14	3	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	53%
14	3	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**3**	**Surface**	**Totals**		**1.9E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
14	**3**		**Percent**		**6.3E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	4	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	25%
14	4	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	53%
14	4	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	22%
14	**4**	**Surface**	**Totals**		**2.1E-08**	**2.0E-07**	**1.2E-07**	n/a	**3.3E-07**	
14	**4**		**Percent**		**6.2E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	5	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	25%
14	5	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	53%
14	5	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	22%
14	**5**	**Surface**	**Totals**		**2.1E-08**	**1.9E-07**	**1.1E-07**	n/a	**3.3E-07**	
14	**5**		**Percent**		**6.3E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	6	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	24%
14	6	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	54%
14	6	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**6**	**Surface**	**Totals**		**2.0E-08**	**1.9E-07**	**1.1E-07**	n/a	**3.2E-07**	
14	**6**		**Percent**		**6.2E-02**	**5.8E-01**	**3.6E-01**	n/a		
14	7	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	24%
14	7	Surface	Hexachlorobenzene	4.00E-01	6.3E-09	5.9E-08	1.3E-07	n/a	1.9E-07	54%
14	7	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	22%
14	**7**	**Surface**	**Totals**		**2.2E-08**	**2.1E-07**	**1.3E-07**	n/a	**3.6E-07**	
14	**7**		**Percent**		**6.2E-02**	**5.8E-01**	**3.6E-01**	n/a		
14	8	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
14	8	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	53%
14	8	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**8**	**Surface**	**Totals**		**2.0E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
14	**8**		**Percent**		**6.2E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	9	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
14	9	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	53%
14	9	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**9**	**Surface**	**Totals**		**2.0E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
14	**9**		**Percent**		**6.2E-02**	**5.9E-01**	**3.5E-01**	n/a		
14	10	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	25%
14	10	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	53%
14	10	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	22%
14	**10**	**Surface**	**Totals**		**2.0E-08**	**1.8E-07**	**1.1E-07**	n/a	**3.1E-07**	
14	**10**		**Percent**		**6.2E-02**	**5.9E-01**	**3.5E-01**	n/a		
518	1	Surface	1,2,4-Trichlorobenzene	2.40E+00	6.8E-10	0.0E+00	n/a	n/a	6.8E-10	0%
518	1	Surface	1,4-Dichlorobenzene	2.40E+00	1.3E-10	0.0E+00	5.8E-16	n/a	1.3E-10	0%
518	1	Surface	2,4-Dinitrotoluene	2.40E+00	7.3E-09	7.0E-08	4.7E-15	n/a	7.7E-08	3%
518	1	Surface	3,3'-Dichlorobenzidine	2.40E+00	1.1E-08	9.9E-08	1.8E-14	n/a	1.1E-07	5%
518	1	Surface	Bis(2-chloroethyl) ether	2.40E+00	2.6E-08	0.0E+00	1.7E-14	n/a	2.6E-08	1%
518	1	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
518	1	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	10%
518	1	Surface	Hexachloroethane	2.40E+00	9.4E-10	8.8E-09	5.8E-16	n/a	9.8E-09	0%
518	1	Surface	Naphthalene	2.40E+00	n/a	n/a	6.0E-08	n/a	6.0E-08	3%
518	1	Surface	N-Nitroso-di-n-propylamine	2.40E+00	1.6E-07	1.5E-06	1.1E-13	n/a	1.7E-06	73%
518	1	Surface	Pentachlorophenol	2.40E+00	9.4E-09	8.8E-08	2.7E-13	n/a	9.8E-08	4%
518	**1**	**Surface**	**Totals**		**2.3E-07**	**1.9E-06**	**2.2E-07**	n/a	**2.3E-06**	
518	**1**		**Percent**		**9.7E-02**	**8.1E-01**	**9.4E-02**	n/a		
520	1	Surface	3,3'-Dichlorobenzidine	1.60E+00	7.0E-09	6.6E-08	1.2E-14	n/a	7.3E-08	4%
520	1	Surface	Cadmium	1.86E+00	n/a	n/a	7.4E-11	n/a	7.4E-11	0%
520	1	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	9%
520	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
520	1	Surface	Pentachlorophenol	1.60E+00	6.3E-09	5.9E-08	1.8E-13	n/a	6.5E-08	4%
520	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.1E-07**	n/a	**1.8E-06**	
520	**1**		**Percent**		**6.5E-02**	**8.2E-01**	**1.2E-01**	n/a		
520	2	Surface	3,3'-Dichlorobenzidine	1.60E+00	7.0E-09	6.6E-08	1.2E-14	n/a	7.3E-08	3%
520	2	Surface	Bis(2-chloroethyl) ether	5.00E-01	5.4E-09	0.0E+00	3.6E-15	n/a	5.4E-09	0%
520	2	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
520	2	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	11%
520	2	Surface	N-Nitroso-di-n-propylamine	5.00E-01	3.4E-08	3.2E-07	2.2E-14	n/a	3.6E-07	16%
520	2	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	67%
520	2	Surface	Pentachlorophenol	1.60E+00	6.3E-09	5.9E-08	1.8E-13	n/a	6.5E-08	3%
520	**2**	**Surface**	**Totals**		**1.6E-07**	**1.8E-06**	**2.6E-07**	n/a	**2.2E-06**	
520	**2**		**Percent**		**7.1E-02**	**8.1E-01**	**1.2E-01**	n/a		
520	3	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
520	3	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	9%
520	3	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
520	3	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
520	**3**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
520	**3**		**Percent**		**6.5E-02**	**8.1E-01**	**1.2E-01**	n/a		
520	4	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
520	4	Surface	Hexachlorobenzene	3.40E-01	5.3E-09	5.0E-08	1.1E-07	n/a	1.6E-07	9%
520	4	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	83%
520	4	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
520	**4**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.1E-07**	n/a	**1.8E-06**	
520	**4**		**Percent**		**6.5E-02**	**8.2E-01**	**1.2E-01**	n/a		
520	5	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	5%
520	5	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	9%
520	5	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	82%
520	5	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
520	**5**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**2.2E-07**	n/a	**1.8E-06**	
520	**5**		**Percent**		**6.5E-02**	**8.1E-01**	**1.2E-01**	n/a		
81	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	12%
81	1	Surface	Bis(2-chloroethyl) ether	4.20E-01	4.5E-09	0.0E+00	3.1E-15	n/a	4.5E-09	1%
81	1	Surface	Hexachlorobenzene	4.20E-01	6.6E-09	6.2E-08	1.3E-07	n/a	2.0E-07	30%
81	1	Surface	N-Nitroso-di-n-propylamine	4.20E-01	2.9E-08	2.7E-07	1.9E-14	n/a	3.0E-07	45%

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

Table D7.6. ELCR for the Current Industrial Worker (Continued)

SWMU	EU	Depth	COPC	EPC (mg/kg or pCi/g)	Ingestion	Dermal	Inhalation	External Exposure	ELCR	Percent[1]
81	1	Surface	Pentachlorophenol	2.10E+00	8.2E-09	7.7E-08	2.4E-13	n/a	8.5E-08	13%
81	**1**	**Surface**	**Totals**		**5.6E-08**	**4.8E-07**	**1.3E-07**	n/a	**6.7E-07**	
81	**1**		**Percent**		**8.3E-02**	**7.2E-01**	**2.0E-01**	n/a		
153	1	Surface	3,3'-Dichlorobenzidine	1.90E+00	8.4E-09	7.9E-08	1.4E-14	n/a	8.7E-08	17%
153	1	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	31%
153	1	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	36%
153	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
153	1	Surface	Pentachlorophenol	1.90E+00	7.4E-09	7.0E-08	2.1E-13	n/a	7.7E-08	15%
153	**1**	**Surface**	**Totals**		**2.2E-08**	**2.0E-07**	**2.8E-07**	n/a	**5.0E-07**	
153	**1**		**Percent**		**4.3E-02**	**4.1E-01**	**5.5E-01**	n/a		
156	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	24%
156	1	Surface	Hexachlorobenzene	3.80E-01	5.9E-09	5.6E-08	1.2E-07	n/a	1.8E-07	54%
156	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	22%
156	**1**	**Surface**	**Totals**		**2.1E-08**	**2.0E-07**	**1.2E-07**	n/a	**3.4E-07**	
156	**1**		**Percent**		**6.2E-02**	**5.8E-01**	**3.6E-01**	n/a		
160	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	4%
160	1	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	8%
160	1	Surface	Hexachlorobenzene	3.50E-01	5.5E-09	5.2E-08	1.1E-07	n/a	1.7E-07	9%
160	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
160	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	76%
160	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	4%
160	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**3.8E-07**	n/a	**2.0E-06**	
160	**1**		**Percent**		**6.0E-02**	**7.5E-01**	**1.9E-01**	n/a		
163	1	Surface	1,1-Dichloroethene	1.68E-01	9.9E-10	2.3E-08	1.7E-07	n/a	1.9E-07	7%
163	1	Surface	3,3'-Dichlorobenzidine	1.70E+00	7.5E-09	7.0E-08	1.3E-14	n/a	7.8E-08	3%
163	1	Surface	Bis(2-chloroethyl) ether	5.00E-01	5.4E-09	0.0E+00	3.6E-15	n/a	5.4E-09	0%
163	1	Surface	Cadmium	2.00E+00	n/a	n/a	8.0E-11	n/a	8.0E-11	0%
163	1	Surface	Hexachlorobenzene	5.00E-01	7.8E-09	7.4E-08	1.6E-07	n/a	2.4E-07	9%
163	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
163	1	Surface	N-Nitroso-di-n-propylamine	5.00E-01	3.4E-08	3.2E-07	2.2E-14	n/a	3.6E-07	13%
163	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	56%
163	1	Surface	Pentachlorophenol	1.70E+00	6.7E-09	6.3E-08	1.9E-13	n/a	6.9E-08	3%
163	1	Surface	Trichloroethene	1.68E-01	5.3E-10	1.2E-08	1.9E-07	n/a	2.0E-07	7%
163	1	Surface	Vinyl chloride	1.68E-01	1.2E-09	2.8E-08	1.7E-08	n/a	4.6E-08	2%
163	**1**	**Surface**	**Totals**		**1.6E-07**	**1.9E-06**	**6.4E-07**	n/a	**2.7E-06**	
163	**1**		**Percent**		**6.1E-02**	**7.0E-01**	**2.4E-01**	n/a		
219	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	4%
219	1	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	8%
219	1	Surface	Hexachlorobenzene	3.60E-01	5.6E-09	5.3E-08	1.1E-07	n/a	1.7E-07	9%
219	1	Surface	PCB, Total	5.00E+00	9.8E-08	1.3E-06	1.1E-07	n/a	1.5E-06	75%
219	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	4%
219	**1**	**Surface**	**Totals**		**1.2E-07**	**1.5E-06**	**3.8E-07**	n/a	**2.0E-06**	
219	**1**		**Percent**		**6.0E-02**	**7.5E-01**	**1.9E-01**	n/a		
488	1	Surface	3,3'-Dichlorobenzidine	1.80E+00	7.9E-09	7.5E-08	1.4E-14	n/a	8.2E-08	17%
488	1	Surface	Chromium	8.50E+01	n/a	n/a	1.6E-07	n/a	1.6E-07	32%
488	1	Surface	Hexachlorobenzene	3.70E-01	5.8E-09	5.4E-08	1.2E-07	n/a	1.8E-07	36%
488	1	Surface	Nickel	6.50E+01	n/a	n/a	3.7E-10	n/a	3.7E-10	0%
488	1	Surface	Pentachlorophenol	1.80E+00	7.0E-09	6.6E-08	2.0E-13	n/a	7.3E-08	15%
488	**1**	**Surface**	**Totals**		**2.1E-08**	**2.0E-07**	**2.8E-07**	n/a	**4.9E-07**	
488	**1**		**Percent**		**4.2E-02**	**4.0E-01**	**5.6E-01**	n/a		

1 = Percentage of COPC to Total
SWMU = solid waste management unit
EU = exposure unit
COPC = chemical of potential concern
EPC = exposure point concentration
ELCR = excess lifetime cancer risk
n/a = not applicable

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ATTACHMENT D8

RISK SUMMARIES, EXCLUDING DERMAL ABSORPTION OF METALS

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Table D8.1. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.49E-05	Cesium-137 Neptunium-237 Thorium-230 Uranium-238	46.0 9.9 21.4 7.8	Ingestion Inhalation Dermal External Exposure	23.7 5.3 5.4 65.6	<1	*no COCs			
Outdoor Worker - surface	3.35E-05	Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-238	15.3 3.7 3.2 11.3 59.8 5.0	Ingestion Inhalation Dermal External Exposure	74.9 1.8 1.8 21.6	<1	*no COCs			
Outdoor Worker - subsurface	6.08E-05	Arsenic Cesium-137 Neptunium-237 Plutonium-239/240 Thorium-230 Trichloroethene Uranium-238	26.7 8.4 2.0 6.2 33.0 18.3 2.8	Ingestion Inhalation Dermal External Exposure	62.1 18.1 7.8 11.9	<1	Arsenic Cobalt	23.0 28.0	Ingestion Inhalation Dermal	83.3 6.4 10.2

Table D8.1. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.72E-05	Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-235 Uranium-238	51.5 11.1 4.1 3.3 18.3 2.0 8.5	Ingestion Inhalation Dermal External Exposure	21.6 1.9 3.1 73.3	<1	*no COCs			
Future Child Resident - surface	6.72E-05	Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-235 Uranium-238	51.5 11.1 4.1 3.3 18.3 2.0 8.5	Ingestion Inhalation Dermal External Exposure	21.6 1.9 3.1 73.3	<1	*no COCs			
Future Teen Recreational User - surface	3.14E-06	Cesium-137	45.8	Ingestion Inhalation Dermal External Exposure	12.7 3.9 18.0 65.3	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.2. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	9.96E-06	PCB, Total	96.2	Ingestion Inhalation Dermal External Exposure	6.3 10.6 83.1	<1	*no COCs			
Future Industrial Worker - surface	1.78E-04	Chromium PCB, Total	3.8 96.2	Ingestion Inhalation Dermal External Exposure	6.3 10.6 83.1	<1	*no COCs			
Outdoor Worker - surface	2.03E-04	Chromium PCB, Total	2.4 97.6	Ingestion Inhalation Dermal External Exposure	39.3 6.9 53.8	<1	*no COCs			
Outdoor Worker - subsurface	1.28E-03	Arsenic Chromium PCB, Total Trichloroethene Vinyl chloride	1.5 0.2 15.4 81.3 1.5	Ingestion Inhalation Dermal External Exposure	9.7 75.8 14.5	45.03	Arsenic cis-1,2-Dichloroeth Trichloroethene	0.3 91.5 7.4	Ingestion Inhalation Dermal	11.7 61.4 26.9

Table D8.2. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.60E-05	PCB, Total Trichloroethene	15.4 81.3	See Outdoor Worker (subsurface)		14.07	cis-1,2-Dichloroeth Trichloroethene	91.5 7.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.16E-04	Chromium PCB, Total	2.5 97.5	Ingestion Inhalation Dermal External Exposure	19.5 7.1 73.4	<1	*no COCs			
Future Child Resident - surface	5.16E-04	Chromium PCB, Total	2.5 97.5	Ingestion Inhalation Dermal External Exposure	19.5 7.1 73.4	<1	Cadmium Mercury	17.1 32.8	Ingestion Inhalation Dermal	93.0 1.1 6.0
Future Teen Recreational User - surface	1.09E-04	Chromium PCB, Total	1.1 98.9	Ingestion Inhalation Dermal External Exposure	1.9 3.2 94.9	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.3. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.65E-06	PCB, Total Uranium-238	43.6 38.3	Ingestion Inhalation Dermal External Exposure	7.1 21.3 37.6 33.9	<1	*no COCs			
Outdoor Worker - surface	3.17E-06	PCB, Total Uranium-238	42.2 46.6	Ingestion Inhalation Dermal External Exposure	42.5 13.2 23.3 21.0	<1	*no COCs			
Outdoor Worker - subsurface	1.78E-05	Arsenic PCB, Total Uranium-238	84.5 7.2 8.3	Ingestion Inhalation Dermal External Exposure	72.7 0.4 23.1 3.7	<1	*no COCs			

Table D8.3. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.33E-06	PCB, Total Uranium-238	36.4 53.6	Ingestion Inhalation Dermal External Exposure	12.2 11.7 27.4 48.6	<1	*no COCs			
Future Child Resident - surface	9.33E-06	PCB, Total Uranium-238	36.4 53.6	Ingestion Inhalation Dermal External Exposure	12.2 11.7 27.4 48.6	<1	*no COCs			
Future Teen Recreational User - surface	1.02E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.4. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.39E-06	Chromium Cobalt-60	57.2 23.1	Ingestion Inhalation Dermal External Exposure	6.7 58.7 11.1 23.5	<1	*no COCs			
Outdoor Worker - surface	6.30E-06	Chromium Thorium-230	36.2 36.4	Ingestion Inhalation Dermal External Exposure	40.9 37.2 7.0 14.8	<1	*no COCs			
Outdoor Worker - subsurface	1.15E-05	Cesium-137 Chromium Thorium-230 Trichloroethene	25.4 15.1 19.9 26.6	Ingestion Inhalation Dermal External Exposure	22.5 39.9 4.3 33.2	<1	*no COCs			

Table D8.4. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.57E-05	Chromium Cobalt-60 PCB, Total Thorium-230	38.1 40.0 13.0 9.0	Ingestion Inhalation Dermal External Exposure	10.7 39.0 9.8 40.5	<1	*no COCs			
Future Child Resident - surface	1.57E-05	Chromium Cobalt-60 PCB, Total Thorium-230	38.1 40.0 13.0 9.0	Ingestion Inhalation Dermal External Exposure	10.7 39.0 9.8 40.5	<1	*no COCs			
Future Teen Recreational User - surface	1.30E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.5. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.11E-06	PCB, Total Total PAH	46.2 53.4	Ingestion Inhalation Dermal External Exposure	7.1 3.8 89.1	<1	*no COCs			
Outdoor Worker - surface	3.70E-06	PCB, Total Total PAH	45.0 54.8	Ingestion Inhalation Dermal External Exposure	42.2 2.4 55.5	<1	*no COCs			
Outdoor Worker - subsurface	4.40E-05	Arsenic PCB, Total Total PAH	91.5 3.8 4.6	Ingestion Inhalation Dermal External Exposure	74.2 0.3 25.4	<1	Arsenic Cobalt	42.4 28.3	Ingestion Inhalation Dermal	82.7 7.0 10.3

Table D8.5. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 1, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.31E-06	PCB, Total Total PAH	45.4 54.3	Ingestion Inhalation Dermal External Exposure	21.1 2.5 76.4	<1	*no COCs			
Future Child Resident - surface	9.31E-06	PCB, Total Total PAH	45.4 54.3	Ingestion Inhalation Dermal External Exposure	21.1 2.5 76.4	<1	*no COCs			
Future Teen Recreational User - surface	2.00E-06	Total PAH	54.7	Ingestion Inhalation Dermal External Exposure	2.0 1.1 96.9	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.6. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 99

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.06E-06	Chromium	59.6	Ingestion	2.0	<1	*no COCs			
				Inhalation	59.9					
				Dermal						
				External Exposure	38.1					
Outdoor Worker - surface	2.66E-06	Chromium	50.8	Ingestion	16.6	<1	Mercury	84.6	Ingestion	99.5
				Inhalation	51.0				Inhalation	0.5
				Dermal					Dermal	
				External Exposure	32.4					
Outdoor Worker - subsurface	2.68E-05	Arsenic	89.4	Ingestion	70.7	<1	Arsenic	40.0	Ingestion	87.3
		Chromium	5.8	Inhalation	5.8		Mercury	29.6	Inhalation	3.7
				Dermal	20.3				Dermal	9.1
				External Exposure	3.2					

Table D8.6. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 99 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.69E-06	Chromium Cobalt-60 Uranium-238	36.6 35.1 28.2	Ingestion Inhalation Dermal External Exposure	2.6 36.8 60.7	<1	*no COCs			
Future Child Resident - surface	9.69E-06	Chromium Cobalt-60 Uranium-238	36.6 35.1 28.2	Ingestion Inhalation Dermal External Exposure	2.6 36.8 60.7	<1	Mercury	84.3	Ingestion Inhalation Dermal	99.2 0.8
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.7. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 99, Pipeline Borings

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface	1.12E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			

Table D8.7. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 99, Pipeline Borings (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

There are no surface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.8. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.29E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.58E-05	Arsenic Chromium	95.1 4.9	Ingestion Inhalation Dermal External Exposure	73.5 4.9 21.6	<1	Arsenic	47.1	Ingestion Inhalation Dermal	86.1 3.3 10.7

Table D8.8. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.50E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.50E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury	71.0	Ingestion Inhalation Dermal	99.2 0.8
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.9. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.81E-06	Chromium	70.3	Ingestion Inhalation Dermal External Exposure	3.3 70.4 26.3	<1	*no COCs			
Outdoor Worker - surface	2.67E-06	Chromium Uranium-238	54.7 45.3	Ingestion Inhalation Dermal External Exposure	24.8 54.8 20.5	<1	*no COCs			
Outdoor Worker - subsurface	2.71E-05	Arsenic Chromium Uranium-238	90.7 5.4 3.9	Ingestion Inhalation Dermal External Exposure	72.2 5.5 20.6 1.8	<1	Arsenic	45.8	Ingestion Inhalation Dermal	86.0 3.6 10.4

Table D8.9. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.94E-06	Chromium Uranium-238	48.3 51.7	Ingestion Inhalation Dermal External Exposure	4.7 48.3 46.9	<1	*no COCs			
Future Child Resident - surface	7.94E-06	Chromium Uranium-238	48.3 51.7	Ingestion Inhalation Dermal External Exposure	4.7 48.3 46.9	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.10. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.74E-05	Arsenic Chromium	84.4 7.4	Ingestion Inhalation Dermal External Exposure	22.8 7.6 65.7 3.8	<1	*no COCs			
Outdoor Worker - surface	3.81E-05	Arsenic Uranium-238	92.5 2.9	Ingestion Inhalation Dermal External Exposure	74.0 2.6 22.2 1.3	<1	Arsenic	92.5	Ingestion Inhalation Dermal	78.5 0.6 20.9
Outdoor Worker - subsurface	3.97E-05	Arsenic Cesium-137 Chromium	87.5 5.1 3.1	Ingestion Inhalation Dermal External Exposure	69.8 3.1 20.8 6.2	<1	Arsenic	92.8	Ingestion Inhalation Dermal	78.4 0.6 21.0

Table D8.10. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.04E-05	Arsenic Chromium Total PAH Uranium-238	88.3 3.6 2.9 5.3	Ingestion Inhalation Dermal External Exposure	49.9 3.7 41.6 4.8	<1	Arsenic	96.0	Ingestion Inhalation Dermal	38.8 0.9 60.3
Future Child Resident - surface	7.04E-05	Arsenic Chromium Total PAH Uranium-238	88.3 3.6 2.9 5.3	Ingestion Inhalation Dermal External Exposure	49.9 3.7 41.6 4.8	<1	Arsenic	93.0	Ingestion Inhalation Dermal	71.8 0.8 27.4
Future Teen Recreational User - surface	9.08E-06	Arsenic	90.9	Ingestion Inhalation Dermal External Exposure	7.9 2.7 87.9 1.5	<1	Arsenic	98.9	Ingestion Inhalation Dermal	9.2 0.7 90.2

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.11. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.86E-06	Chromium Total PAH Uranium-238	41.6 31.9 26.3	Ingestion Inhalation Dermal External Exposure	5.4 41.9 29.5 23.3	<1	*no COCs			
Outdoor Worker - surface	4.17E-06	Chromium Total PAH Uranium-238	28.5 36.1 35.4	Ingestion Inhalation Dermal External Exposure	35.2 28.7 20.2 16.0	<1	Mercury	83.2	Ingestion Inhalation Dermal	99.5 0.5
Outdoor Worker - subsurface	2.87E-05	Arsenic Cesium-137 Chromium	85.8 4.3 4.8	Ingestion Inhalation Dermal External Exposure	68.9 4.8 20.6 5.7	<1	Arsenic Mercury	34.6 23.3	Ingestion Inhalation Dermal	89.8 2.4 7.8

Table D8.11. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.19E-05	Chromium Total PAH Uranium-238	26.2 31.6 42.1	Ingestion Inhalation Dermal External Exposure	10.9 26.4 24.5 38.2	<1	*no COCs			
Future Child Resident - surface	1.19E-05	Chromium Total PAH Uranium-238	26.2 31.6 42.1	Ingestion Inhalation Dermal External Exposure	10.9 26.4 24.5 38.2	<1	Mercury	82.9	Ingestion Inhalation Dermal	99.2 0.8
Future Teen Recreational User - surface	1.31E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.12. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.74E-06	Chromium	55.5	Ingestion Inhalation Dermal External Exposure	4.4 55.9 13.5 26.2	<1	*no COCs			
Outdoor Worker - surface	2.79E-06	Chromium Uranium-238	40.2 42.1	Ingestion Inhalation Dermal External Exposure	30.7 40.5 9.8 19.0	<1	Mercury	81.7	Ingestion Inhalation Dermal	99.4 0.6
Outdoor Worker - subsurface	3.50E-05	Arsenic Chromium Total PAH	66.9 3.9 26.5	Ingestion Inhalation Dermal External Exposure	64.8 4.0 30.0 1.2	<1	Arsenic Mercury	38.0 26.2	Ingestion Inhalation Dermal	84.8 6.6 8.6

Table D8.12. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.17E-06	Chromium Total PAH Uranium-238	36.1 14.9 48.8	Ingestion Inhalation Dermal External Exposure	7.8 36.3 11.6 44.3	<1	*no COCs			
Future Child Resident - surface	8.17E-06	Chromium Total PAH Uranium-238	36.1 14.9 48.8	Ingestion Inhalation Dermal External Exposure	7.8 36.3 11.6 44.3	<1	Mercury	81.4	Ingestion Inhalation Dermal	99.1 0.9
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.13. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.01E-06	Chromium	61.0	Ingestion Inhalation Dermal External Exposure	4.3 61.5 34.2	<1	*no COCs			
Outdoor Worker - surface	2.04E-06	Uranium-238	55.2	Ingestion Inhalation Dermal External Exposure	30.2 44.9 24.9	<1	*no COCs			
Outdoor Worker - subsurface	<1E-6					<1	*no COCs			

Table D8.13. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.21E-06	Chromium Uranium-238	38.3 61.4	Ingestion Inhalation Dermal External Exposure	5.6 38.6 55.8	<1	*no COCs			
Future Child Resident - surface	6.21E-06	Chromium Uranium-238	38.3 61.4	Ingestion Inhalation Dermal External Exposure	5.6 38.6 55.8	<1	Manganese	71.3	Ingestion Inhalation Dermal	61.9 38.1
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.14. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 7

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.77E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.31E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.59E-05	Arsenic Chromium	94.9 5.0	Ingestion Inhalation Dermal External Exposure	73.3 5.1 21.5	<1	Arsenic	73.5	Ingestion Inhalation Dermal	76.6 6.7 16.6

Table D8.14. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 7 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.44E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.44E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.15. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 8

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.12E-05	Chromium Total PAH	15.9 73.4	Ingestion Inhalation Dermal External Exposure	6.7 16.0 70.8 6.5	<1	*no COCs			
Outdoor Worker - surface	1.30E-05	Chromium Total PAH Uranium-238	10.1 76.8 9.1	Ingestion Inhalation Dermal External Exposure	40.8 10.2 44.9 4.1	<1	*no COCs			
Outdoor Worker - subsurface	3.94E-05	Arsenic Cesium-137 Chromium Total PAH Uranium-238	66.5 6.1 3.8 19.6 2.6	Ingestion Inhalation Dermal External Exposure	62.1 4.0 26.7 7.2	<1	Arsenic Cobalt	41.4 39.4	Ingestion Inhalation Dermal	83.7 6.2 10.0

Table D8.15. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 8 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.36E-05	Bis(2-ethylhexyl)p Chromium Total PAH Uranium-238	3.6 10.2 74.2 11.9	Ingestion Inhalation Dermal External Exposure	18.6 10.3 60.3 10.8	<1	*no COCs			
Future Child Resident - surface	3.36E-05	Bis(2-ethylhexyl)p Chromium Total PAH Uranium-238	3.6 10.2 74.2 11.9	Ingestion Inhalation Dermal External Exposure	18.6 10.3 60.3 10.8	<1	Manganese	86.5	Ingestion Inhalation Dermal	47.9 44.3 7.7
Future Teen Recreational User - surface	6.13E-06	Total PAH	88.0	Ingestion Inhalation Dermal External Exposure	2.1 5.3 90.1 2.5	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.16. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 9

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.32E-05	Arsenic Chromium	87.0 13.0	Ingestion Inhalation Dermal External Exposure	22.7 13.2 64.1	<1	*no COCs			
Outdoor Worker - surface	2.88E-05	Arsenic Chromium	95.6 4.4	Ingestion Inhalation Dermal External Exposure	73.9 4.4 21.7	<1	Arsenic	99.9	Ingestion Inhalation Dermal	77.0 0.4 22.6
Outdoor Worker - subsurface	2.47E-05	Arsenic Chromium	95.5 4.5	Ingestion Inhalation Dermal External Exposure	73.8 4.5 21.7	<1	Arsenic	78.1	Ingestion Inhalation Dermal	77.0 5.4 17.7

Table D8.16. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 9 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.18E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.8 6.5 41.8	<1	Arsenic	100.0	Ingestion Inhalation Dermal	36.7 0.6 62.7
Future Child Resident - surface	5.18E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.8 6.5 41.8	<1	Arsenic	99.9	Ingestion Inhalation Dermal	70.1 0.5 29.4
Future Teen Recreational User - surface	6.76E-06	Arsenic	95.4	Ingestion Inhalation Dermal External Exposure	8.1 4.7 87.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.17. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 10

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.42E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.54E-05	Arsenic Cesium-137 Chromium Total PAH	48.1 26.6 4.7 17.1	Ingestion Inhalation Dermal External Exposure	14.3 4.9 51.2 29.6	<1	*no COCs			
Outdoor Worker - surface	4.18E-05	Arsenic Cesium-137 Total PAH Uranium-238	70.1 12.1 12.7 3.0	Ingestion Inhalation Dermal External Exposure	61.5 2.2 23.0 13.3	<1	Arsenic	92.9	Ingestion Inhalation Dermal	78.3 0.7 21.0
Outdoor Worker - subsurface	3.94E-05	Arsenic Cesium-137 Chromium Total PAH Uranium-238	67.4 12.8 3.1 13.5 3.2	Ingestion Inhalation Dermal External Exposure	59.9 3.2 22.8 14.1	<1	Arsenic	56.6	Ingestion Inhalation Dermal	86.8 0.4 12.8

Table D8.17. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 10 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.06E-04	Arsenic Cesium-137 Chromium Total PAH Uranium-238	48.9 32.2 2.2 12.5 4.1	Ingestion Inhalation Dermal External Exposure	30.3 2.3 31.6 35.9	<1	Arsenic	96.1	Ingestion Inhalation Dermal	38.6 1.1 60.3
Future Child Resident - surface	1.06E-04	Arsenic Cesium-137 Chromium Total PAH Uranium-238	48.9 32.2 2.2 12.5 4.1	Ingestion Inhalation Dermal External Exposure	30.3 2.3 31.6 35.9	<1	Arsenic	93.3	Ingestion Inhalation Dermal	71.5 1.0 27.5
Future Teen Recreational User - surface	1.15E-05	Arsenic Cesium-137 Total PAH	59.5 12.3 24.8	Ingestion Inhalation Dermal External Exposure	5.7 2.0 78.7 13.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.18. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 11

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.88E-06	Chromium Total PAH	37.6 46.6	Ingestion Inhalation Dermal External Exposure	4.5 39.1 56.4	<1	*no COCs			
Outdoor Worker - surface	2.97E-06	Total PAH	55.3	Ingestion Inhalation Dermal External Exposure	31.3 28.1 40.6	<1	*no COCs			
Outdoor Worker - subsurface	2.95E-05	Arsenic Chromium Total PAH	88.0 4.7 5.6	Ingestion Inhalation Dermal External Exposure	71.1 4.9 24.0	<1	Arsenic	54.1	Ingestion Inhalation Dermal	87.3 0.5 12.2

Table D8.18. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 11 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.53E-06	Chromium PCB, Total Total PAH	27.9 17.5 54.3	Ingestion Inhalation Dermal External Exposure	15.6 29.1 55.4	<1	*no COCs			
Future Child Resident - surface	7.53E-06	Chromium PCB, Total Total PAH	27.9 17.5 54.3	Ingestion Inhalation Dermal External Exposure	15.6 29.1 55.4	<1	Mercury	76.8	Ingestion Inhalation Dermal	98.8 1.2
Future Teen Recreational User - surface	1.36E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.19. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 12

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.72E-05	Chromium Total PAH	12.2 87.7	Ingestion Inhalation Dermal External Exposure	6.6 12.4 81.0	<1	*no COCs			
Outdoor Worker - surface	1.99E-05	Chromium Total PAH	7.8 92.2	Ingestion Inhalation Dermal External Exposure	40.5 7.9 51.6	<1	*no COCs			
Outdoor Worker - subsurface	3.83E-05	Arsenic Chromium Total PAH	57.8 4.1 38.1	Ingestion Inhalation Dermal External Exposure	61.4 4.1 34.4	<1	Arsenic	71.4	Ingestion Inhalation Dermal	77.0 6.8 16.2

Table D8.19. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 12 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.99E-05	Chromium Total PAH	8.2 91.8	Ingestion Inhalation Dermal External Exposure	20.4 8.3 71.3	<1	*no COCs			
Future Child Resident - surface	4.99E-05	Chromium Total PAH	8.2 91.8	Ingestion Inhalation Dermal External Exposure	20.4 8.3 71.3	<1	*no COCs			
Future Teen Recreational User - surface	1.03E-05	Total PAH	96.3	Ingestion Inhalation Dermal External Exposure	2.0 3.8 94.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.20. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 13

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.13E-06	Chromium Total PAH	50.5 49.3	Ingestion Inhalation Dermal External Exposure	3.7 50.8 45.5	<1	*no COCs			
Outdoor Worker - surface	3.06E-06	Chromium Total PAH	38.2 61.6	Ingestion Inhalation Dermal External Exposure	27.1 38.4 34.5	<1	*no COCs			
Outdoor Worker - subsurface	2.68E-05	Arsenic Chromium Total PAH	89.1 5.7 5.2	Ingestion Inhalation Dermal External Exposure	71.1 5.8 23.1	<1	Arsenic	79.9	Ingestion Inhalation Dermal	76.0 5.9 18.1

Table D8.20. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 13 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.78E-06	Chromium Total PAH	39.4 60.4	Ingestion Inhalation Dermal External Exposure	13.4 39.6 46.9	<1	*no COCs			
Future Child Resident - surface	7.78E-06	Chromium Total PAH	39.4 60.4	Ingestion Inhalation Dermal External Exposure	13.4 39.6 46.9	<1	*no COCs			
Future Teen Recreational User - surface	1.30E-06	Total PAH	77.8	Ingestion Inhalation Dermal External Exposure	1.6 22.2 76.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.21. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 14

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.73E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - surface	1.28E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - subsurface	2.76E-05	Arsenic Chromium	94.6 5.4	Ingestion Inhalation Dermal External Exposure	73.1 5.5 21.5 	<1	Arsenic Mercury	43.0 27.3	Ingestion Inhalation Dermal	86.4 3.9 9.7

Table D8.21. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 14 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.35E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.35E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury	99.9	Ingestion Inhalation Dermal	100.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.22. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 15

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.77E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.31E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.31E-05	Arsenic Chromium	93.5 6.4	Ingestion Inhalation Dermal External Exposure	72.3 6.5 21.2	<1	Arsenic	73.7	Ingestion Inhalation Dermal	77.2 6.1 16.7

Table D8.22. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 15 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.43E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.43E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.23. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 16

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.33E-05	Arsenic Chromium	86.7 13.2	Ingestion Inhalation Dermal External Exposure	22.7 13.4 63.9	<1	*no COCs			
Outdoor Worker - surface	2.91E-05	Arsenic Chromium	95.5 4.5	Ingestion Inhalation Dermal External Exposure	73.8 4.6 21.7	<1	Arsenic	69.2	Ingestion Inhalation Dermal	83.8 0.5 15.7
Outdoor Worker - subsurface	2.77E-05	Arsenic Chromium	95.3 4.7	Ingestion Inhalation Dermal External Exposure	73.6 4.8 21.6	<1	Arsenic	54.0	Ingestion Inhalation Dermal	78.1 9.7 12.2

Table D8.23. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 16 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.24E-05	Arsenic Chromium	93.4 6.5	Ingestion Inhalation Dermal External Exposure	51.7 6.6 41.7	<1	Arsenic	82.2	Ingestion Inhalation Dermal	47.5 1.0 51.6
Future Child Resident - surface	5.24E-05	Arsenic Chromium	93.4 6.5	Ingestion Inhalation Dermal External Exposure	51.7 6.6 41.7	<1	Arsenic Thallium Vanadium	71.1 10.2 10.7	Ingestion Inhalation Dermal	78.3 0.8 20.9
Future Teen Recreational User - surface	6.82E-06	Arsenic	95.3	Ingestion Inhalation Dermal External Exposure	8.1 4.8 87.1	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.24. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 17

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.58E-05	Arsenic Chromium Total PAH	73.3 9.7 17.0	Ingestion Inhalation Dermal External Exposure	20.4 9.9 69.7	<1	*no COCs			
Outdoor Worker - surface	3.22E-05	Arsenic Chromium Total PAH	86.3 3.5 10.1	Ingestion Inhalation Dermal External Exposure	71.1 3.6 25.3	<1	Arsenic	96.9	Ingestion Inhalation Dermal	76.8 0.4 22.8
Outdoor Worker - subsurface	3.26E-05	Arsenic Cesium-137 Chromium Total PAH	82.5 6.7 4.1 6.6	Ingestion Inhalation Dermal External Exposure	66.7 4.2 22.4 6.7	<1	Arsenic	90.8	Ingestion Inhalation Dermal	78.1 0.7 21.2

Table D8.24. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 17 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.02E-05	Arsenic Chromium Total PAH	81.5 5.0 13.6	Ingestion Inhalation Dermal External Exposure	48.1 5.0 46.9	<1	Arsenic	96.6	Ingestion Inhalation Dermal	36.5 0.6 62.9
Future Child Resident - surface	6.02E-05	Arsenic Chromium Total PAH	81.5 5.0 13.6	Ingestion Inhalation Dermal External Exposure	48.1 5.0 46.9	<1	Arsenic	96.8	Ingestion Inhalation Dermal	69.8 0.6 29.6
Future Teen Recreational User - surface	8.56E-06	Arsenic Total PAH	76.1 20.6	Ingestion Inhalation Dermal External Exposure	6.9 3.3 89.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.25. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 18

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.29E-05	Arsenic Chromium	82.3 17.6	Ingestion Inhalation Dermal External Exposure	21.5 17.8 60.7	<1	*no COCs			
Outdoor Worker - surface	2.72E-05	Arsenic Chromium	93.8 6.2	Ingestion Inhalation Dermal External Exposure	72.5 6.3 21.3	<1	Arsenic	93.0	Ingestion Inhalation Dermal	78.3 0.7 21.0
Outdoor Worker - subsurface	3.03E-05	Arsenic Chromium	94.4 5.5	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic Iron	40.5 23.7	Ingestion Inhalation Dermal	87.0 3.8 9.2

Table D8.25. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 18 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.93E-05	Arsenic Chromium	91.0 8.9	Ingestion Inhalation Dermal External Exposure	50.3 9.0 40.6	<1	Arsenic	96.2	Ingestion Inhalation Dermal	38.6 1.0 60.4
Future Child Resident - surface	4.93E-05	Arsenic Chromium	91.0 8.9	Ingestion Inhalation Dermal External Exposure	50.3 9.0 40.6	<1	Arsenic	93.4	Ingestion Inhalation Dermal	71.6 1.0 27.5
Future Teen Recreational User - surface	6.38E-06	Arsenic	93.5	Ingestion Inhalation Dermal External Exposure	7.9 6.6 85.5	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.26. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 19

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.23E-05	Arsenic Chromium	87.0 13.0	Ingestion Inhalation Dermal External Exposure	22.7 13.2 64.1	<1	*no COCs			
Outdoor Worker - surface	2.70E-05	Arsenic Chromium	95.6 4.4	Ingestion Inhalation Dermal External Exposure	73.8 4.5 21.7	<1	Arsenic	93.7	Ingestion Inhalation Dermal	78.2 0.6 21.2
Outdoor Worker - subsurface	2.52E-05	Arsenic Chromium	95.3 4.7	Ingestion Inhalation Dermal External Exposure	73.6 4.8 21.6	<1	Arsenic	88.7	Ingestion Inhalation Dermal	79.3 0.7 20.1

Table D8.26. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 19 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.85E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.7 6.5 41.8	<1	Arsenic	96.6	Ingestion Inhalation Dermal	38.4 1.0 60.6
Future Child Resident - surface	4.85E-05	Arsenic Chromium	93.6 6.4	Ingestion Inhalation Dermal External Exposure	51.7 6.5 41.8	<1	Arsenic	94.1	Ingestion Inhalation Dermal	71.4 0.9 27.7
Future Teen Recreational User - surface	6.32E-06	Arsenic	95.4	Ingestion Inhalation Dermal External Exposure	8.1 4.7 87.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.27. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 20

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.42E-05	Arsenic Chromium	83.5 12.2	Ingestion Inhalation Dermal External Exposure	22.1 12.9 65.0	<1	*no COCs			
Outdoor Worker - surface	3.05E-05	Arsenic Chromium	93.5 4.2	Ingestion Inhalation Dermal External Exposure	73.2 4.5 22.4	<1	Arsenic Cobalt	27.0 37.5	Ingestion Inhalation Dermal	87.5 6.4 6.1
Outdoor Worker - subsurface	2.98E-05	Arsenic Chromium	92.6 5.9	Ingestion Inhalation Dermal External Exposure	72.1 6.1 21.8	<1	Arsenic Cobalt	29.9 30.3	Ingestion Inhalation Dermal	86.0 7.3 6.8

Table D8.27. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 20 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.54E-05	Arsenic Chromium Total PAH	90.8 6.1 2.9	Ingestion Inhalation Dermal External Exposure	50.8 6.4 42.7	<1	Arsenic	39.5	Ingestion Inhalation Dermal	61.0 14.3 24.8
Future Child Resident - surface	5.54E-05	Arsenic Chromium Total PAH	90.8 6.1 2.9	Ingestion Inhalation Dermal External Exposure	50.8 6.4 42.7	2.58	Arsenic Cobalt Manganese Mercury	27.9 35.5 16.6 12.0	Ingestion Inhalation Dermal	82.2 9.6 8.2
Future Teen Recreational User - surface	7.36E-06	Arsenic	90.8	Ingestion Inhalation Dermal External Exposure	7.8 4.6 87.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.28. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 21

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.83E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.36E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	8.64E-05	Arsenic Chromium	98.2 1.6	Ingestion Inhalation Dermal External Exposure	75.8 1.9 22.3	3.30	Arsenic Cobalt Iron Manganese	16.1 29.5 7.1 38.8	Ingestion Inhalation Dermal	80.4 16.0 3.6

Table D8.28. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 21 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.08E-06	Arsenic	98.2	See Outdoor Worker (subsurface)		1.03	Arsenic Cobalt Manganese	16.1 29.5 38.8	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.56E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.56E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury Thallium	60.9 22.1	Ingestion Inhalation Dermal	99.2 0.8
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.29. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 22

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.35E-06	PCB, Total	97.3	Ingestion	6.4	<1	*no COCs			
				Inhalation	9.7					
				Dermal	84.0					
				External Exposure						
Future Industrial Worker - surface	5.98E-05	Chromium	2.7	Ingestion	6.4	<1	*no COCs			
		PCB, Total	97.3	Inhalation	9.7					
				Dermal	84.0					
				External Exposure						
Outdoor Worker - surface	6.85E-05	Chromium	1.8	Ingestion	39.6	<1	*no COCs			
		PCB, Total	98.2	Inhalation	6.2					
				Dermal	54.2					
				External Exposure						
Outdoor Worker - subsurface	9.45E-05	Arsenic	29.3	Ingestion	50.0	<1	Arsenic	42.2	Ingestion	85.1
		Cesium-137	1.5	Inhalation	4.4		Cobalt	30.8	Inhalation	5.3
		Chromium	1.2	Dermal	44.1				Dermal	9.6
		PCB, Total	67.9	External Exposure	1.5					

Table D8.29. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 22 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.18E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.74E-04	Chromium PCB, Total	1.8 98.2	Ingestion Inhalation Dermal External Exposure	19.6 6.5 73.9	<1	*no COCs			
Future Child Resident - surface	1.74E-04	Chromium PCB, Total	1.8 98.2	Ingestion Inhalation Dermal External Exposure	19.6 6.5 73.9	<1	Manganese	99.7	Ingestion Inhalation Dermal	48.9 51.1
Future Teen Recreational User - surface	3.68E-05	PCB, Total	99.2	Ingestion Inhalation Dermal External Exposure	1.9 2.9 95.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.30. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 23

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.38E-05	Arsenic Chromium	84.1 15.9	Ingestion Inhalation Dermal External Exposure	22.0 16.1 62.0	<1	*no COCs			
Outdoor Worker - surface	2.95E-05	Arsenic Chromium	94.5 5.5	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic	60.2	Ingestion Inhalation Dermal	85.9 0.5 13.6
Outdoor Worker - subsurface	3.10E-05	Arsenic Cesium-137 Chromium	87.4 7.9 4.7	Ingestion Inhalation Dermal External Exposure	67.6 4.7 19.8 7.8	<1	Arsenic	38.6	Ingestion Inhalation Dermal	86.1 3.1 10.8

Table D8.30. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 23 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.33E-05	Arsenic Chromium	92.0 8.0	Ingestion Inhalation Dermal External Exposure	50.9 8.1 41.1	<1	Arsenic	75.8	Ingestion Inhalation Dermal	51.5 0.9 47.5
Future Child Resident - surface	5.33E-05	Arsenic Chromium	92.0 8.0	Ingestion Inhalation Dermal External Exposure	50.9 8.1 41.1	1.13	Arsenic Iron	62.3 29.6	Ingestion Inhalation Dermal	80.9 0.7 18.3
Future Teen Recreational User - surface	6.92E-06	Arsenic	94.2	Ingestion Inhalation Dermal External Exposure	8.0 5.8 86.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.31. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 24

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.06E-06	Chromium	80.9	Ingestion Inhalation Dermal External Exposure	1.4 81.3 17.3	<1	*no COCs			
Outdoor Worker - surface	1.71E-06	Chromium	72.1	Ingestion Inhalation Dermal External Exposure	12.1 72.5 15.4	<1	*no COCs			
Outdoor Worker - subsurface	3.20E-05	Arsenic Cesium-137 Chromium	89.7 5.8 3.6	Ingestion Inhalation Dermal External Exposure	69.8 3.6 20.9 5.7	<1	Arsenic Iron	43.0 27.5	Ingestion Inhalation Dermal	87.6 2.7 9.7

Table D8.31. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 24 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.42E-06	Chromium Total PAH	73.1 26.6	Ingestion Inhalation Dermal External Exposure	5.9 73.5 20.6	<1	*no COCs			
Future Child Resident - surface	4.42E-06	Chromium Total PAH	73.1 26.6	Ingestion Inhalation Dermal External Exposure	5.9 73.5 20.6	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.32. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 25

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.38E-06	Chromium	85.1	Ingestion Inhalation Dermal External Exposure	1.1 85.4 13.5	<1	*no COCs			
Outdoor Worker - surface	1.93E-06	Chromium	77.8	Ingestion Inhalation Dermal External Exposure	9.7 78.0 12.3	<1	*no COCs			
Outdoor Worker - subsurface	2.70E-05	Arsenic Chromium	93.7 4.7	Ingestion Inhalation Dermal External Exposure	73.1 4.8 22.1	<1	Arsenic	58.5	Ingestion Inhalation Dermal	79.3 7.5 13.2

Table D8.32. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 25 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.01E-06	Chromium Total PAH	78.6 21.1	Ingestion Inhalation Dermal External Exposure	4.7 78.9 16.4	<1	*no COCs			
Future Child Resident - surface	5.01E-06	Chromium Total PAH	78.6 21.1	Ingestion Inhalation Dermal External Exposure	4.7 78.9 16.4	<1	Manganese	73.7	Ingestion Inhalation Dermal	59.7 40.3
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.33. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 26

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.39E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.03E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.31E-05	Arsenic Chromium	94.7 5.1	Ingestion Inhalation Dermal External Exposure	73.2 5.3 21.5	<1	Arsenic Cobalt	33.1 38.2	Ingestion Inhalation Dermal	89.0 3.5 7.5

Table D8.33. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 26 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.69E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.69E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.34. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 27

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.74E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.28E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.69E-05	Arsenic Chromium	95.3 4.7	Ingestion Inhalation Dermal External Exposure	73.6 4.8 21.6	<1	Arsenic	87.2	Ingestion Inhalation Dermal	79.6 0.6 19.7

Table D8.34. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 27 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.37E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.37E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.35. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 28

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.41E-05	Arsenic Chromium	85.7 14.3	Ingestion Inhalation Dermal External Exposure	22.4 14.5 63.1	<1	*no COCs			
Outdoor Worker - surface	3.05E-05	Arsenic Chromium	95.1 4.9	Ingestion Inhalation Dermal External Exposure	73.5 5.0 21.6	<1	Arsenic	65.2	Ingestion Inhalation Dermal	78.1 7.2 14.7
Outdoor Worker - subsurface	2.88E-05	Arsenic Chromium	94.6 5.4	Ingestion Inhalation Dermal External Exposure	73.0 5.5 21.5	<1	Arsenic	62.7	Ingestion Inhalation Dermal	78.1 7.7 14.2

Table D8.35. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 28 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.50E-05	Arsenic Chromium	92.9 7.1	Ingestion Inhalation Dermal External Exposure	51.4 7.2 41.4	<1	Arsenic	73.2	Ingestion Inhalation Dermal	41.8 12.3 45.9
Future Child Resident - surface	5.50E-05	Arsenic Chromium	92.9 7.1	Ingestion Inhalation Dermal External Exposure	51.4 7.2 41.4	1.13	Arsenic Manganese Vanadium	64.8 18.9 9.2	Ingestion Inhalation Dermal	70.6 10.4 19.1
Future Teen Recreational User - surface	7.16E-06	Arsenic	94.9	Ingestion Inhalation Dermal External Exposure	8.0 5.2 86.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.36. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 29

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.68E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.24E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	3.59E-05	Arsenic Chromium	95.9 3.9	Ingestion Inhalation Dermal External Exposure	74.1 4.1 21.8	<1	Arsenic Cobalt Manganese	34.7 26.7 17.6	Ingestion Inhalation Dermal	84.2 8.0 7.9

Table D8.36. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 29 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.26E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.26E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.37. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 30

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.88E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.39E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury	83.8	Ingestion Inhalation Dermal	99.5 0.5
Outdoor Worker - subsurface	2.42E-05	Arsenic Chromium	94.2 5.8	Ingestion Inhalation Dermal External Exposure	72.8 5.9 21.4	<1	Arsenic Mercury	45.2 32.4	Ingestion Inhalation Dermal	86.2 3.6 10.2

Table D8.37. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 30 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.65E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.65E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	Mercury	83.5	Ingestion Inhalation Dermal	99.2 0.8
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.38. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 31

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	7.63E-06	Cesium-137 Uranium-238	86.7 13.3	Ingestion Inhalation Dermal External Exposure	1.6 0.0 98.4	<1	*no COCs			
Outdoor Worker - surface	6.41E-06	Cesium-137 Uranium-238	77.1 22.9	Ingestion Inhalation Dermal External Exposure	13.4 0.0 86.6	<1	*no COCs			
Outdoor Worker - subsurface	6.41E-06	Cesium-137 Uranium-238	77.1 22.9	Ingestion Inhalation Dermal External Exposure	13.4 0.0 86.6	<1	*no COCs			

Table D8.38. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 194, EU 31 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.83E-05	Cesium-137 Uranium-238	87.0 13.0	Ingestion Inhalation Dermal External Exposure	1.3 0.0 98.7	<1	*no COCs			
Future Child Resident - surface	3.83E-05	Cesium-137 Uranium-238	87.0 13.0	Ingestion Inhalation Dermal External Exposure	1.3 0.0 98.7	<1	*no COCs			
Future Teen Recreational User - surface	1.59E-06	Cesium-137	87.4	Ingestion Inhalation Dermal External Exposure	0.8 0.0 99.1	<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.39. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 196, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.76E-06	Neptunium-237	41.6	Ingestion Inhalation Dermal External Exposure	4.2 25.8 70.0	<1	*no COCs			
Outdoor Worker - surface	2.79E-06	Uranium-238	47.2	Ingestion Inhalation Dermal External Exposure	29.8 18.9 51.3	<1	Nickel	75.9	Ingestion Inhalation Dermal	96.2 3.8
Outdoor Worker - subsurface	3.08E-05	Arsenic Chromium Uranium-238	82.2 8.9 4.3	Ingestion Inhalation Dermal External Exposure	66.2 10.5 18.6 4.6	8.78	Antimony Arsenic Beryllium Cadmium Cobalt Iron Nickel Thallium	12.0 1.8 2.3 6.5 15.0 1.7 1.2 56.4	Ingestion Inhalation Dermal	97.0 0.8 2.2

Table D8.39. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 196, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		2.74	Antimony Cadmium Cobalt Thallium	12.0 6.5 15.0 56.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.16E-05	Chromium Neptunium-237 Uranium-238	10.9 49.7 38.4	Ingestion Inhalation Dermal External Exposure	4.1 11.9 84.1	<1	*no COCs			
Future Child Resident - surface	1.16E-05	Chromium Neptunium-237 Uranium-238	10.9 49.7 38.4	Ingestion Inhalation Dermal External Exposure	4.1 11.9 84.1	<1	Nickel	76.4	Ingestion Inhalation Dermal	94.0 6.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.40. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 196, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.21E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.15E-05	PCB, Total Total PAH Uranium-238	37.4 53.4 6.0	Ingestion Inhalation Dermal External Exposure	7.2 6.0 81.5 5.3	<1	*no COCs			
Outdoor Worker - surface	2.57E-05	PCB, Total Total PAH Uranium-238	36.2 54.5 7.3	Ingestion Inhalation Dermal External Exposure	42.5 3.7 50.5 3.3	<1	*no COCs			
Outdoor Worker - subsurface	2.20E-04	Arsenic PCB, Total Total PAH Uranium-238	10.3 4.2 84.6 0.9	Ingestion Inhalation Dermal External Exposure	47.3 0.3 52.0 0.4	<1	Antimony Arsenic	65.3 17.1	Ingestion Inhalation Dermal	94.8 0.6 4.6

Table D8.40. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 196, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.75E-06	Total PAH	84.6	See Outdoor Worker (subsurface)		<1	Antimony	65.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.64E-05	Chromium PCB, Total Total PAH Uranium-238	2.0 35.6 52.7 9.6	Ingestion Inhalation Dermal External Exposure	19.7 3.8 67.8 8.7	<1	*no COCs			
Future Child Resident - surface	6.64E-05	Chromium PCB, Total Total PAH Uranium-238	2.0 35.6 52.7 9.6	Ingestion Inhalation Dermal External Exposure	19.7 3.8 67.8 8.7	<1	*no COCs			
Future Teen Recreational User - surface	1.30E-05	PCB, Total Total PAH	38.9 58.2	Ingestion Inhalation Dermal External Exposure	2.1 1.8 94.2 1.9	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.41. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 489

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.64E-06	Chromium Total PAH	37.9 38.1	Ingestion Inhalation Dermal External Exposure	5.5 38.3 35.2 21.0	<1	*no COCs			
Outdoor Worker - surface	3.97E-06	Chromium Total PAH Uranium-238	25.7 42.6 31.5	Ingestion Inhalation Dermal External Exposure	36.0 25.9 23.8 14.2	<1	*no COCs			
Outdoor Worker - subsurface	2.71E-05	Arsenic Total PAH Uranium-238	89.1 6.3 4.6	Ingestion Inhalation Dermal External Exposure	74.1 0.1 23.7 2.1	<1	Arsenic	88.9	Ingestion Inhalation Dermal	78.4 0.8 20.8

Table D8.41. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 489 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.12E-05	Chromium Total PAH Uranium-238	24.0 37.9 38.0	Ingestion Inhalation Dermal External Exposure	11.9 24.2 29.4 34.5	<1	*no COCs			
Future Child Resident - surface	1.12E-05	Chromium Total PAH Uranium-238	24.0 37.9 38.0	Ingestion Inhalation Dermal External Exposure	11.9 24.2 29.4 34.5	<1	*no COCs			
Future Teen Recreational User - surface	1.34E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.42. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 531

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.91E-06	Arsenic	90.4	Ingestion	24.2	<1	*no COCs			
				Inhalation	3.4					
				Dermal	68.2					
				External Exposure	4.1					
Future Industrial Worker - surface	5.19E-05	Arsenic	90.4	Ingestion	24.2	<1	Arsenic	82.5	Ingestion	36.6
		Chromium	3.2	Inhalation	3.4				Inhalation	1.6
		Uranium-238	3.9	Dermal	68.2				Dermal	61.8
				External Exposure	4.1					
Outdoor Worker - surface	1.18E-04	Arsenic	95.3	Ingestion	75.4	1.10	Arsenic	64.2	Ingestion	84.7
		Chromium	1.0	Inhalation	1.1		Iron	25.7	Inhalation	0.4
		Total PAH	0.9	Dermal	22.1				Dermal	14.9
		Uranium-238	2.5	External Exposure	1.3					
Outdoor Worker - subsurface	1.19E-04	Arsenic	95.2	Ingestion	75.4	1.13	Arsenic	62.2	Ingestion	83.9
		Chromium	1.1	Inhalation	1.2		Iron	24.9	Inhalation	1.6
		Total PAH	0.9	Dermal	22.1				Dermal	14.4
		Uranium-238	2.5	External Exposure	1.3					

Table D8.42. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 531 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.48E-06	Arsenic	95.2	See Outdoor Worker (subsurface)		<1	Arsenic	62.2	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.17E-04	Arsenic Chromium Total PAH Uranium-235 Uranium-238	91.8 1.5 1.3 0.8 4.6	Ingestion Inhalation Dermal External Exposure	51.5 1.6 41.9 5.0	<1	Arsenic Iron	78.0 14.9	Ingestion Inhalation Dermal	49.0 0.7 50.3
Future Child Resident - surface	2.17E-04	Arsenic Chromium Total PAH Uranium-235 Uranium-238	91.8 1.5 1.3 0.8 4.6	Ingestion Inhalation Dermal External Exposure	51.5 1.6 41.9 5.0	4.30	Arsenic Iron Nickel Uranium Zinc	66.2 24.1 2.6 2.4 2.4	Ingestion Inhalation Dermal	79.4 0.6 20.0
Future Teen Recreational User - surface	2.78E-05	Arsenic	95.0	Ingestion Inhalation Dermal External Exposure	8.2 1.2 89.0 1.6	<1	Arsenic	92.0	Ingestion Inhalation Dermal	13.3 0.6 86.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.43. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 200

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.42E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.54E-05	Cesium-137 Chromium PCB, Total Uranium-238	26.3 7.5 54.6 8.3	Ingestion Inhalation Dermal External Exposure	4.7 11.5 48.8 35.0	<1	*no COCs			
Outdoor Worker - surface	2.64E-05	Cesium-137 Chromium PCB, Total Uranium-238	18.9 5.3 60.8 11.6	Ingestion Inhalation Dermal External Exposure	32.2 8.2 34.8 24.9	<1	*no COCs			
Outdoor Worker - subsurface	4.81E-05	Arsenic Cesium-137 Chromium PCB, Total Uranium-238	48.8 8.4 3.2 33.3 5.0	Ingestion Inhalation Dermal External Exposure	54.3 4.7 29.9 11.0	<1	Arsenic	47.3	Ingestion Inhalation Dermal	86.3 3.0 10.7

Table D8.43. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 200 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.17E-05	Cesium-137 Chromium PCB, Total Total PAH Uranium-235 Uranium-238	36.6 4.0 44.4 1.6 2.0 11.3	Ingestion Inhalation Dermal External Exposure	10.3 6.2 34.7 48.8	<1	*no COCs			
Future Child Resident - surface	9.17E-05	Cesium-137 Chromium PCB, Total Total PAH Uranium-235 Uranium-238	36.6 4.0 44.4 1.6 2.0 11.3	Ingestion Inhalation Dermal External Exposure	10.3 6.2 34.7 48.8	<1	Mercury Uranium	56.1 22.9	Ingestion Inhalation Dermal	98.6 1.4
Future Teen Recreational User - surface	1.13E-05	Cesium-137 PCB, Total	12.4 77.3	Ingestion Inhalation Dermal External Exposure	1.8 4.7 76.9 16.6	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.44. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 212

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.40E-06	Thorium-230	31.1	Ingestion Inhalation Dermal External Exposure	35.0 4.7 18.9 41.4	<1	*no COCs			
Future Industrial Worker - surface	6.07E-05	Arsenic Cesium-137 Chromium Neptunium-237 Thorium-230 Uranium-238	23.8 11.5 2.0 24.3 31.1 3.1	Ingestion Inhalation Dermal External Exposure	35.0 4.7 18.9 41.4	<1	*no COCs			
Outdoor Worker - surface	1.80E-04	Arsenic Cesium-137 Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-238	19.3 2.9 6.8 0.6 2.3 65.7 1.5	Ingestion Inhalation Dermal External Exposure	83.8 1.2 4.7 10.3	<1	Arsenic Iron	46.5 44.1	Ingestion Inhalation Dermal	89.1 0.4 10.5
Outdoor Worker - subsurface	1.81E-04	Arsenic Cesium-137 Chromium Neptunium-237 PCB, Total Plutonium-239/240 Thorium-230 Uranium-238	19.2 2.9 0.9 6.7 0.6 2.3 65.4 1.5	Ingestion Inhalation Dermal External Exposure	83.4 1.6 4.7 10.3	<1	Arsenic Cobalt Iron	24.7 23.5 23.5	Ingestion Inhalation Dermal	91.2 3.2 5.6

Table D8.44. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 212 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.26E-06	Thorium-230	65.4	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.65E-04	Arsenic	23.1	Ingestion	39.5	<1	Arsenic	64.4	Ingestion	58.8
		Cesium-137	13.3	Inhalation	1.6				Inhalation	0.8
		Chromium	0.9	Dermal	11.1				Dermal	40.4
		Cobalt-60	0.9	External Exposure	47.8					
		Neptunium-237	28.0							
		PCB, Total	1.1							
		Plutonium-239/240	0.9							
		Thorium-230	27.4							
		Uranium-235	1.0							
		Uranium-238	3.5							
Future Child Resident - surface	2.65E-04	Arsenic	23.1	Ingestion	39.5	1.80	Arsenic	48.8	Ingestion	85.1
		Cesium-137	13.3	Inhalation	1.6		Iron	42.1	Inhalation	0.5
		Chromium	0.9	Dermal	11.1				Dermal	14.4
		Cobalt-60	0.9	External Exposure	47.8					
		Neptunium-237	28.0							
		PCB, Total	1.1							
		Plutonium-239/240	0.9							
		Thorium-230	27.4							
		Uranium-235	1.0							
		Uranium-238	3.5							
Future Teen Recreational User - surface	1.64E-05	Arsenic	49.7	Ingestion	16.2	<1	Arsenic	88.5	Ingestion	18.6
		Cesium-137	9.0	Inhalation	2.5				Inhalation	0.7
		Neptunium-237	18.8	Dermal	49.0				Dermal	80.7
		Thorium-230	13.5	External Exposure	32.3					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.45. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 213, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	6.25E-06	Chromium Total PAH Uranium-238	25.3 46.4 21.9	Ingestion Inhalation Dermal External Exposure	6.4 26.0 48.2 19.4	<1	*no COCs			
Outdoor Worker - surface	7.16E-06	Chromium Total PAH Uranium-238	16.4 49.5 27.8	Ingestion Inhalation Dermal External Exposure	39.5 16.8 31.2 12.5	<1	*no COCs			
Outdoor Worker - subsurface	2.95E-05	Arsenic Chromium Total PAH Uranium-238	75.2 4.5 12.0 6.7	Ingestion Inhalation Dermal External Exposure	67.7 4.7 24.6 3.0	<1	Arsenic	67.7	Ingestion Inhalation Dermal	76.9 7.8 15.3

Table D8.45. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 213, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.98E-05	Chromium PCB, Total Total PAH Uranium-238	15.5 5.8 44.6 34.0	Ingestion Inhalation Dermal External Exposure	14.2 15.9 39.0 30.9	<1	*no COCs			
Future Child Resident - surface	1.98E-05	Chromium PCB, Total Total PAH Uranium-238	15.5 5.8 44.6 34.0	Ingestion Inhalation Dermal External Exposure	14.2 15.9 39.0 30.9	<1	*no COCs			
Future Teen Recreational User - surface	2.72E-06	Total PAH	70.3	Ingestion Inhalation Dermal External Exposure	2.3 10.9 77.4 9.4	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.46. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 213, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.49E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.11E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	1.67E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			

Table D8.46. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 213, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.90E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.90E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.47. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 214

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.78E-05	Arsenic	100.0	Ingestion Inhalation Dermal External Exposure	77.3 0.1 22.7	<1	Arsenic	97.2	Ingestion Inhalation Dermal	77.7 0.4 22.0

Table D8.47. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 214 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	<1E-6	*no COCs				<1	*no COCs			
Future Child Resident - surface	<1E-6	*no COCs				<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.48. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 215

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.27E-06	Chromium Total PAH	58.0 41.7	Ingestion Inhalation Dermal External Exposure	3.2 58.3 38.5	<1	*no COCs			
Outdoor Worker - surface	3.08E-06	Chromium Total PAH	45.7 54.2	Ingestion Inhalation Dermal External Exposure	23.8 45.9 30.3	<1	Iron	90.8	Ingestion Inhalation Dermal	99.7 0.3
Outdoor Worker - subsurface	3.62E-05	Arsenic Chromium Total PAH	67.6 3.9 28.5	Ingestion Inhalation Dermal External Exposure	64.8 4.0 31.3	<1	Arsenic Iron	41.2 51.8	Ingestion Inhalation Dermal	90.4 0.3 9.3

Table D8.48. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 215 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.86E-06	Chromium Total PAH	46.9 52.9	Ingestion Inhalation Dermal External Exposure	11.8 47.1 41.1	<1	*no COCs			
Future Child Resident - surface	7.86E-06	Chromium Total PAH	46.9 52.9	Ingestion Inhalation Dermal External Exposure	11.8 47.1 41.1	<1	Iron	90.6	Ingestion Inhalation Dermal	99.5 0.5
Future Teen Recreational User - surface	1.25E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.49. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 216

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.09E-06	Total PAH	61.6	Ingestion Inhalation Dermal External Exposure	6.8 19.4 56.9 16.9	<1	*no COCs			
Outdoor Worker - surface	4.80E-06	Total PAH Uranium-238	64.2 23.6	Ingestion Inhalation Dermal External Exposure	41.1 12.3 35.9 10.7	<1	*no COCs			
Outdoor Worker - subsurface	2.85E-05	Arsenic Cesium-137 Total PAH Uranium-238	72.7 12.5 10.8 4.0	Ingestion Inhalation Dermal External Exposure	63.3 0.1 22.5 14.1	<1	Arsenic	100.0	Ingestion Inhalation Dermal	77.0 0.4 22.6

Table D8.49. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 216 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.31E-05	Chromium Total PAH Uranium-238	11.7 58.8 29.4	Ingestion Inhalation Dermal External Exposure	15.8 11.8 45.7 26.7	<1	*no COCs			
Future Child Resident - surface	1.31E-05	Chromium Total PAH Uranium-238	11.7 58.8 29.4	Ingestion Inhalation Dermal External Exposure	15.8 11.8 45.7 26.7	<1	*no COCs			
Future Teen Recreational User - surface	1.96E-06	Total PAH	84.7	Ingestion Inhalation Dermal External Exposure	2.3 7.4 82.9 7.4	<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.50. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 217, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	3.60E-06	Chromium	79.0	Ingestion Inhalation Dermal External Exposure	2.1 81.2 16.7	<1	*no COCs			
Outdoor Worker - surface	3.15E-06	Chromium	66.9	Ingestion Inhalation Dermal External Exposure	17.1 68.8 14.1	<1	Cobalt	80.1	Ingestion Inhalation Dermal	94.4 5.6
Outdoor Worker - subsurface	2.53E-05	Arsenic Chromium	89.8 6.3	Ingestion Inhalation Dermal External Exposure	71.4 6.6 20.4 1.7	<1	Arsenic Cobalt	28.0 38.0	Ingestion Inhalation Dermal	89.8 3.9 6.3

Table D8.50. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 217, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.00E-06	Chromium Uranium-238	61.3 37.1	Ingestion Inhalation Dermal External Exposure	3.4 63.0 33.6	<1	*no COCs			
Future Child Resident - surface	9.00E-06	Chromium Uranium-238	61.3 37.1	Ingestion Inhalation Dermal External Exposure	3.4 63.0 33.6	1.09	Cobalt Manganese	78.1 13.3	Ingestion Inhalation Dermal	91.3 8.7
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.51. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 217, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.30E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.32E-05	Arsenic Chromium Total PAH	48.3 14.5 36.8	Ingestion Inhalation Dermal External Exposure	15.4 15.0 69.6	<1	*no COCs			
Outdoor Worker - surface	3.99E-05	Arsenic Chromium Total PAH	67.5 6.3 26.1	Ingestion Inhalation Dermal External Exposure	63.6 6.4 29.9	<1	Arsenic Cobalt Iron	23.9 29.0 21.8	Ingestion Inhalation Dermal	92.1 2.5 5.4
Outdoor Worker - subsurface	3.42E-05	Arsenic Chromium Total PAH	70.2 4.7 24.4	Ingestion Inhalation Dermal External Exposure	65.0 5.4 29.6	1.53	Arsenic Cobalt Iron Mercury	9.8 63.5 9.9 7.0	Ingestion Inhalation Dermal	95.8 1.9 2.2

Table D8.51. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 217, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Cobalt	63.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.00E-05	Arsenic Chromium Total PAH	59.2 8.2 32.5	Ingestion Inhalation Dermal External Exposure	40.0 8.4 51.6	<1	Arsenic	38.1	Ingestion Inhalation Dermal	70.0 6.1 23.9
Future Child Resident - surface	8.00E-05	Arsenic Chromium Total PAH	59.2 8.2 32.5	Ingestion Inhalation Dermal External Exposure	40.0 8.4 51.6	2.69	Arsenic Cobalt Iron Manganese Mercury	25.3 28.1 21.0 5.9 13.6	Ingestion Inhalation Dermal	88.7 3.9 7.4
Future Teen Recreational User - surface	1.25E-05	Arsenic Total PAH	50.2 44.8	Ingestion Inhalation Dermal External Exposure	5.2 5.0 89.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.52. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 221

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.31E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.34E-05	Chromium PCB, Total Total PAH Uranium-238	9.9 11.4 73.8 4.9	Ingestion Inhalation Dermal External Exposure	6.9 10.9 77.9 4.3	<1	*no COCs			
Outdoor Worker - surface	2.75E-05	Chromium PCB, Total Total PAH Uranium-238	6.2 11.2 76.6 6.0	Ingestion Inhalation Dermal External Exposure	41.4 6.9 49.0 2.7	<1	*no COCs			
Outdoor Worker - subsurface	5.74E-05	Arsenic Chromium PCB, Total Total PAH Uranium-238	51.9 2.8 5.4 36.7 2.9	Ingestion Inhalation Dermal External Exposure	60.0 3.5 35.3 1.3	1.79	Arsenic Cobalt Iron Manganese Mercury	10.4 47.3 10.7 10.1 8.0	Ingestion Inhalation Dermal	92.7 4.9 2.4

Table D8.52. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 221 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Cobalt	47.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.05E-05	Chromium PCB, Total Total PAH Uranium-238	6.4 11.1 74.6 7.9	Ingestion Inhalation Dermal External Exposure	19.5 7.0 66.3 7.2	<1	*no COCs			
Future Child Resident - surface	7.05E-05	Chromium PCB, Total Total PAH Uranium-238	6.4 11.1 74.6 7.9	Ingestion Inhalation Dermal External Exposure	19.5 7.0 66.3 7.2	<1	Iron	71.0	Ingestion Inhalation Dermal	98.6 1.4
Future Teen Recreational User - surface	1.37E-05	PCB, Total Total PAH	12.2 83.0	Ingestion Inhalation Dermal External Exposure	2.1 3.4 93.0 1.5	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.53. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 222

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.45E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.59E-05	Chromium	6.1	Ingestion	9.8	<1	*no COCs			
		PCB, Total	28.8	Inhalation	8.4					
		Total PAH	11.6	Dermal	35.5					
		Uranium-235	6.9	External Exposure	46.2					
		Uranium-238	44.5							
Outdoor Worker - surface	3.54E-05	Chromium	3.3	Ingestion	51.2	<1	*no COCs			
		PCB, Total	24.4	Inhalation	4.5					
		Total PAH	10.3	Dermal	19.2					
		Uranium-234	10.4	External Exposure	25.0					
		Uranium-235	4.4							
		Uranium-238	47.2							
Outdoor Worker - subsurface	5.58E-05	Arsenic	44.0	Ingestion	59.0	<1	Arsenic	57.0	Ingestion	82.0
		Cesium-137	4.7	Inhalation	3.4				Inhalation	5.1
		Chromium	2.8	Dermal	19.5				Dermal	12.9
		PCB, Total	10.7	External Exposure	18.1					
		Total PAH	6.5							
		Uranium-234	4.5							
		Uranium-235	2.8							
		Uranium-238	23.5							

Table D8.53. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 222 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.02E-04	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	3.0 21.5 8.9 2.1 8.8 55.6	Ingestion Inhalation Dermal External Exposure	13.5 4.1 23.1 59.2	<1	*no COCs			
Future Child Resident - surface	1.02E-04	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	3.0 21.5 8.9 2.1 8.8 55.6	Ingestion Inhalation Dermal External Exposure	13.5 4.1 23.1 59.2	<1	Uranium	65.1	Ingestion Inhalation Dermal	97.1 2.9
Future Teen Recreational User - surface	9.67E-06	PCB, Total Total PAH Uranium-238	48.4 20.4 23.7	Ingestion Inhalation Dermal External Exposure	3.5 4.1 66.4 26.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.54. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 227, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.79E-06	PCB, Total Uranium-238	32.6 40.2	Ingestion Inhalation Dermal External Exposure	8.7 4.9 35.9 50.5	<1	*no COCs			
Future Industrial Worker - surface	6.77E-05	Cesium-137 Chromium Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	3.3 2.3 4.9 32.6 8.4 5.6 40.2	Ingestion Inhalation Dermal External Exposure	8.7 4.9 35.9 50.5	<1	*no COCs			
Outdoor Worker - surface	8.78E-05	Cesium-137 Chromium Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	1.9 1.3 3.1 29.1 7.9 6.2 3.7 45.0	Ingestion Inhalation Dermal External Exposure	47.9 2.8 20.5 28.8	<1	Uranium	75.5	Ingestion Inhalation Dermal	98.6 1.4
Outdoor Worker - subsurface	1.02E-04	Arsenic Cesium-137 Chromium Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	20.0 1.4 1.3 2.4 23.9 6.8 4.9 2.9 35.0	Ingestion Inhalation Dermal External Exposure	53.5 2.5 21.5 22.4	<1	Arsenic Uranium	41.7 38.7	Ingestion Inhalation Dermal	89.7 0.8 9.4

Table D8.54. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 227, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.27E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.74E-04	Cesium-137 Chromium Cobalt-60 Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	4.1 1.1 1.6 6.1 23.7 6.3 1.2 6.9 48.8	Ingestion Inhalation Dermal External Exposure	12.1 2.3 22.8 62.9	<1	*no COCs			
Future Child Resident - surface	2.74E-04	Cesium-137 Chromium Cobalt-60 Neptunium-237 PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	4.1 1.1 1.6 6.1 23.7 6.3 1.2 6.9 48.8	Ingestion Inhalation Dermal External Exposure	12.1 2.3 22.8 62.9	<1	Nickel Uranium	24.3 75.0	Ingestion Inhalation Dermal	97.8 2.2
Future Teen Recreational User - surface	2.55E-05	PCB, Total Total PAH Uranium-238	54.2 14.7 21.2	Ingestion Inhalation Dermal External Exposure	3.1 2.3 66.5 28.1	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.55. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 227, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.05E-06	PCB, Total	84.8	Ingestion	6.2	<1	*no COCs			
				Inhalation	11.3					
				Dermal	78.1					
				External Exposure	4.4					
Future Industrial Worker - surface	3.66E-05	Chromium	5.1	Ingestion	6.2	<1	*no COCs			
		PCB, Total	84.8	Inhalation	11.3					
		Total PAH	5.3	Dermal	78.1					
				External Exposure	4.4					
Outdoor Worker - surface	4.16E-05	Chromium	3.3	Ingestion	39.0	<1	Cobalt	43.1	Ingestion	99.0
		PCB, Total	86.3	Inhalation	7.3				Inhalation	1.0
		Total PAH	5.7	Dermal	50.8				Dermal	
		Uranium-238	3.2	External Exposure	2.8					
Outdoor Worker - subsurface	5.50E-05	Arsenic	36.6	Ingestion	53.0	<1	Arsenic	28.3	Ingestion	90.1
		Chromium	2.0	Inhalation	4.6		Cobalt	28.1	Inhalation	3.5
		PCB, Total	53.3	Dermal	40.1				Dermal	6.4
		Total PAH	4.3	External Exposure	2.3					
		Uranium-238	2.4							

Table D8.55. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 227, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.09E-04	Chromium Cobalt-60 PCB, Total Total PAH Uranium-238	3.3 3.6 83.4 5.4 4.2	Ingestion Inhalation Dermal External Exposure	18.3 7.4 67.0 7.4	<1	*no COCs			
Future Child Resident - surface	1.09E-04	Chromium Cobalt-60 PCB, Total Total PAH Uranium-238	3.3 3.6 83.4 5.4 4.2	Ingestion Inhalation Dermal External Exposure	18.3 7.4 67.0 7.4	<1	Cobalt Mercury	43.2 39.7	Ingestion Inhalation Dermal	98.4 1.6
Future Teen Recreational User - surface	2.15E-05	PCB, Total Total PAH	90.8 6.0	Ingestion Inhalation Dermal External Exposure	1.9 3.5 93.0 1.6	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.56. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 228

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.30E-05	Chromium Neptunium-237 Total PAH Uranium-238	48.1 22.7 8.7 17.0	Ingestion Inhalation Dermal External Exposure	2.9 48.3 8.0 40.8	<1	*no COCs			
Outdoor Worker - surface	1.21E-05	Chromium Neptunium-237 Total PAH Uranium-238	38.4 20.2 11.4 26.6	Ingestion Inhalation Dermal External Exposure	22.5 38.5 6.4 32.6	<1	Mercury	62.5	Ingestion Inhalation Dermal	96.3 0.6 3.1
Outdoor Worker - subsurface	7.99E-05	Arsenic Chromium Neptunium-237 Total PAH Uranium-238	84.2 5.8 3.1 1.7 4.0	Ingestion Inhalation Dermal External Exposure	68.5 5.9 20.1 5.6	<1	Arsenic Iron Mercury	51.0 22.8 13.2	Ingestion Inhalation Dermal	85.5 2.3 12.2

Table D8.56. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 228 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Arsenic	51.0	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.36E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	27.9 34.0 7.9 5.2 25.0	Ingestion Inhalation Dermal External Exposure	4.5 28.0 6.1 61.4	<1	*no COCs			
Future Child Resident - surface	4.36E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	27.9 34.0 7.9 5.2 25.0	Ingestion Inhalation Dermal External Exposure	4.5 28.0 6.1 61.4	<1	Mercury	61.4	Ingestion Inhalation Dermal	94.7 1.0 4.3
Future Teen Recreational User - surface	3.04E-06	Chromium	37.6	Ingestion Inhalation Dermal External Exposure	1.6 37.7 24.0 36.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.57. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 27

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface	<1E-6					<1	*no COCs			

Table D8.57. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 27 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

There are no surface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.58. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 76

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.79E-06	Total PAH	93.0	Ingestion	7.6	<1	*no COCs			
				Inhalation	0.5					
				Dermal	89.6					
				External Exposure	2.4					
Future Industrial Worker - surface	3.19E-05	PCB, Total	4.3	Ingestion	7.6	<1	*no COCs			
		Total PAH	93.0	Inhalation	0.5					
				Dermal	89.6					
				External Exposure	2.4					
Outdoor Worker - surface	3.91E-05	PCB, Total	4.1	Ingestion	44.1	<1	*no COCs			
		Total PAH	92.7	Inhalation	0.3					
		Uranium-238	3.2	Dermal	54.2					
				External Exposure	1.4					
Outdoor Worker - subsurface	7.07E-05	Arsenic	44.7	Ingestion	58.9	<1	Arsenic	68.3	Ingestion	84.1
		PCB, Total	2.3	Inhalation	0.2				Inhalation	0.4
		Total PAH	51.3	Dermal	40.1				Dermal	15.5
		Uranium-238	1.8	External Exposure	0.8					

Table D8.58. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 76 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.87E-05	PCB, Total Total PAH Uranium-238	4.1 91.6 4.2	Ingestion Inhalation Dermal External Exposure	21.6 0.3 74.3 3.9	<1	*no COCs			
Future Child Resident - surface	9.87E-05	PCB, Total Total PAH Uranium-238	4.1 91.6 4.2	Ingestion Inhalation Dermal External Exposure	21.6 0.3 74.3 3.9	<1	*no COCs			
Future Teen Recreational User - surface	2.06E-05	Total PAH	95.0	Ingestion Inhalation Dermal External Exposure	2.1 0.1 97.0 0.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.59. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 165

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.29E-05	Arsenic	27.7	Ingestion	13	<1	*no COCs			
		Cesium-137	17.5	Inhalation	2.4					
		PCB, Total	19.2	Dermal	49.7					
		Total PAH	13.7	External	35					
		Uranium-238	16.4	Exposure						
Future Industrial Worker - surface	2.30E-04	Arsenic	27.7	Ingestion	13	<1	Arsenic	89.1	Ingestion	28.9
		Cesium-137	17.5	Inhalation	2.4				Inhalation	5.9
		Chromium	0.5	Dermal	49.7				Dermal	65.2
		Neptunium-237	0.7	External	35					
		PCB, Total	19.2	Exposure						
		Total PAH	13.7							
		Uranium-234	1.3							
		Uranium-235	2.3							
		Uranium-238	16.4							
Outdoor Worker - surface	3.59E-04	Arsenic	42.6	Ingestion	58.8	1.16	Arsenic	82.4	Ingestion	79.6
		Cesium-137	8.4	Inhalation	1.1		Uranium	10.8	Inhalation	1.7
		Neptunium-237	0.4	Dermal	23.5				Dermal	18.7
		PCB, Total	14.2	External	16.5					
		Plutonium-239/240	0.5	Exposure						
		Thorium-230	0.8							
		Total PAH	10.7							
		Uranium-234	5.7							
		Uranium-235	1.3							
		Uranium-238	15.2							
Outdoor Worker - subsurface	3.72E-04	Arsenic	41.3	Ingestion	58.3	1.29	Arsenic	74.1	Ingestion	81.4
		Cesium-137	8.1	Inhalation	1.2		Uranium	9.7	Inhalation	1.6
		Neptunium-237	0.3	Dermal	24.5				Dermal	16.9
		PCB, Total	16.4	External	16.0					
		Pentachlorophenol	0.5	Exposure						
		Plutonium-239/240	0.5							
		Thorium-230	0.7							
		Total PAH	10.4							
		Uranium-234	5.5							
		Uranium-235	1.2							
		Uranium-238	14.7							

Table D8.59. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 165 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	4.65E-06	Arsenic	41.3	See Outdoor Worker (subsurface)		<1	Arsenic	74.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.36E-04	Arsenic	28.8	Ingestion	24.4	<1	Arsenic	89.2	Ingestion	41.1
		Cesium-137	21.7	Inhalation	1.1				Inhalation	2.8
		Chromium	0.3	Dermal	31.3				Dermal	56.1
		Napthalene	0.2	External	43.3					
		Neptunium-237	0.8	Exposure						
		PCB, Total	13.8							
		Plutonium-239/240	0.1							
		Thorium-230	0.2							
		Total PAH	10.3							
		Uranium-234	1.3							
		Uranium-235	2.8							
		Uranium-238	19.8							
Future Child Resident - surface	9.36E-04	Arsenic	28.8	Ingestion	24.4	4.65	Arsenic	83.0	Ingestion	73.0
		Cesium-137	21.7	Inhalation	1.1		Uranium	9.9	Inhalation	2.5
		Chromium	0.3	Dermal	31.3				Dermal	24.5
		Napthalene	0.2	External	43.3					
		Neptunium-237	0.8	Exposure						
		PCB, Total	13.8							
		Plutonium-239/240	0.1							
		Thorium-230	0.2							
		Total PAH	10.3							
		Uranium-234	1.3							
		Uranium-235	2.8							
		Uranium-238	19.8							
Future Teen Recreational User - surface	1.02E-04	Arsenic	35.0	Ingestion	4.8	<1	Arsenic	95.9	Ingestion	10.2
		Cesium-137	8.3	Inhalation	1.0				Inhalation	2.1
		PCB, Total	27.0	Dermal	77.8				Dermal	87.7
		Total PAH	20.3	External	16.5					
		Uranium-235	1.1	Exposure						
		Uranium-238	7.3							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.60. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 170

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.32E-06	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.66E-06	Uranium-238	78.8	Ingestion Inhalation Dermal External Exposure	45.6 0.1 54.3	<1	*no COCs			
Outdoor Worker - subsurface	5.83E-06	Cesium-137 Uranium-238	49.9 37.3	Ingestion Inhalation Dermal External Exposure	21.7 0.1 78.3	<1	*no COCs			

Table D8.60. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 170 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.55E-06	Neptunium-237 Uranium-238	32.5 67.5	Ingestion Inhalation Dermal External Exposure	6.5 0.1 93.4	<1	*no COCs			
Future Child Resident - surface	6.55E-06	Neptunium-237 Uranium-238	32.5 67.5	Ingestion Inhalation Dermal External Exposure	6.5 0.1 93.4	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.61. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 158

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.18E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.11E-05	Arsenic Chromium Total PAH Uranium-238	48.1 9.5 29.5 10.6	Ingestion Inhalation Dermal External Exposure	16.0 10.0 62.7 11.3	<1	*no COCs			
Outdoor Worker - surface	3.71E-05	Arsenic Chromium Total PAH Uranium-238	65.7 4.0 20.5 8.7	Ingestion Inhalation Dermal External Exposure	64.7 4.2 26.4 4.7	<1	Arsenic Cobalt Mercury	27.0 33.7 21.5	Ingestion Inhalation Dermal	90.3 3.6 6.1
Outdoor Worker - subsurface	3.73E-05	Arsenic Chromium Total PAH Uranium-238	61.5 3.4 26.5 7.2	Ingestion Inhalation Dermal External Exposure	63.3 3.5 28.8 4.4	<1	Arsenic Cobalt Mercury	27.3 28.1 23.1	Ingestion Inhalation Dermal	89.9 3.9 6.2

Table D8.61. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 158 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.90E-05	Arsenic Chromium Total PAH Uranium-235 Uranium-238	54.4 4.9 24.0 2.6 13.9	Ingestion Inhalation Dermal External Exposure	36.7 5.2 42.9 15.2	<1	Arsenic	41.3	Ingestion Inhalation Dermal	65.8 8.3 25.9
Future Child Resident - surface	7.90E-05	Arsenic Chromium Total PAH Uranium-235 Uranium-238	54.4 4.9 24.0 2.6 13.9	Ingestion Inhalation Dermal External Exposure	36.7 5.2 42.9 15.2	2.17	Arsenic Cobalt Manganese Mercury	28.3 32.4 8.5 20.5	Ingestion Inhalation Dermal	86.2 5.4 8.3
Future Teen Recreational User - surface	1.07E-05	Arsenic Total PAH	53.3 38.3	Ingestion Inhalation Dermal External Exposure	5.6 3.6 86.2 4.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.62. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 169

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	9.22E-06	Arsenic PCB, Total Total PAH	12.4 32.4 47.1	Ingestion Inhalation Dermal External Exposure	9.4 6.8 80.5 3.3	<1	*no COCs			
Future Industrial Worker - surface	1.65E-04	Arsenic Chromium PCB, Total Total PAH Uranium-235 Uranium-238	12.4 4.3 32.4 47.1 0.7 2.9	Ingestion Inhalation Dermal External Exposure	9.4 6.8 80.5 3.3	<1	Arsenic	58.8	Ingestion Inhalation Dermal	51.8 5.3 42.9
Outdoor Worker - surface	2.21E-04	Arsenic Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	22.2 2.4 27.9 42.8 1.0 0.5 3.1	Ingestion Inhalation Dermal External Exposure	50.0 3.7 44.4 1.8	<1	Arsenic Iron Nickel	34.7 23.5 11.4	Ingestion Inhalation Dermal	91.2 1.0 7.9
Outdoor Worker - subsurface	2.21E-04	Arsenic Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	22.1 2.4 27.9 42.7 1.0 0.5 3.1	Ingestion Inhalation Dermal External Exposure	49.9 3.8 44.3 1.9	1.97	Arsenic Cobalt Iron Nickel	15.5 46.4 10.5 7.5	Ingestion Inhalation Dermal	94.0 2.5 3.5

Table D8.62. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 169 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.77E-06	Total PAH	42.7	See Outdoor Worker (subsurface)		<1	Cobalt	46.4	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.23E-04	Arsenic	16.5	Ingestion	25.8	<1	Arsenic	52.1	Ingestion	65.1
		Chromium	2.6	Inhalation	4.1				Inhalation	2.2
		PCB, Total	29.9	Dermal	64.9				Dermal	32.7
		Total PAH	45.1	External Exposure	5.2					
		Uranium-234	0.3							
		Uranium-235	1.1							
		Uranium-238	4.5							
Future Child Resident - surface	5.23E-04	Arsenic	16.5	Ingestion	25.8	3.36	Aluminum	5.8	Ingestion	87.7
		Chromium	2.6	Inhalation	4.1		Arsenic	36.7	Inhalation	1.5
		PCB, Total	29.9	Dermal	64.9		Copper	3.6	Dermal	10.8
		Total PAH	45.1	External Exposure	5.2		Iron	22.6		
		Uranium-234	0.3				Mercury	10.0		
		Uranium-235	1.1				Nickel	11.3		
		Uranium-238	4.5				Uranium	6.4		
Future Teen Recreational User - surface	9.84E-05	Arsenic	11.6	Ingestion	2.8	<1	Arsenic	81.4	Ingestion	23.4
		Chromium	1.3	Inhalation	2.1				Inhalation	2.4
		PCB, Total	34.0	Dermal	94.0				Dermal	74.2
		Total PAH	51.8	External Exposure	1.1					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.63. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 19

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.94E-06	Total PAH	100.0	Ingestion	7.6	<1	*no COCs			
				Inhalation	0.2					
				Dermal	92.3					
				External Exposure						
Future Industrial Worker - surface	8.83E-05	Total PAH	100.0	Ingestion	7.6	<1	*no COCs			
				Inhalation	0.2					
				Dermal	92.3					
				External Exposure						
Outdoor Worker - surface	1.08E-04	Total PAH	100.0	Ingestion	44.0	<1	*no COCs			
				Inhalation	0.1					
				Dermal	56.0					
				External Exposure						
Outdoor Worker - subsurface	1.71E-04	Arsenic	14.2	Ingestion	53.0	<1	Arsenic	18.2	Ingestion	94.1
		Total PAH	63.0	Inhalation	0.2		Cobalt	18.9	Inhalation	0.9
		Uranium-234	5.7	Dermal	38.5		Copper	18.7	Dermal	5.0
		Uranium-235	1.7	External Exposure	8.3		Uranium	22.8		
		Uranium-238	15.3							

Table D8.63. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 19 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.14E-06	Total PAH	63.0	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.69E-04	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	*no COCs			
Future Child Resident - surface	2.69E-04	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	Thallium	83.1	Ingestion Inhalation Dermal	95.0 0.4 4.6
Future Teen Recreational User - surface	5.81E-05	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	2.1 0.0 97.9	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.64. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 138, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.68E-05	Arsenic Chromium PCB, Total Total PAH	63.6 10.7 15.9 9.8	Ingestion Inhalation Dermal External Exposure	18.4 12.0 69.6	<1	*no COCs			
Outdoor Worker - surface	3.20E-05	Arsenic Chromium PCB, Total Total PAH	79.9 4.1 9.6 6.3	Ingestion Inhalation Dermal External Exposure	68.4 4.6 27.0	<1	Arsenic Mercury	39.6 37.3	Ingestion Inhalation Dermal	88.8 0.4 10.8
Outdoor Worker - subsurface	3.25E-05	Arsenic Chromium PCB, Total Total PAH	79.9 4.3 9.5 6.2	Ingestion Inhalation Dermal External Exposure	68.3 4.9 26.8	<1	Arsenic Cobalt Mercury	21.9 14.5 22.8	Ingestion Inhalation Dermal	92.0 2.1 5.8

Table D8.64. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 138, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.14E-05	Arsenic Chromium PCB, Total Total PAH	73.4 5.6 12.8 8.2	Ingestion Inhalation Dermal External Exposure	45.0 6.3 48.7	<1	Arsenic	54.3	Ingestion Inhalation Dermal	58.1 0.9 41.0
Future Child Resident - surface	6.14E-05	Arsenic Chromium PCB, Total Total PAH	73.4 5.6 12.8 8.2	Ingestion Inhalation Dermal External Exposure	45.0 6.3 48.7	1.56	Antimony Arsenic Cadmium Mercury	11.1 41.5 7.1 35.5	Ingestion Inhalation Dermal	84.7 0.6 14.7
Future Teen Recreational User - surface	9.07E-06	Arsenic PCB, Total Total PAH	66.0 18.4 11.9	Ingestion Inhalation Dermal External Exposure	6.2 4.0 89.8	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.65. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 138, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.15E-06	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.37E-06	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.78E-05	Arsenic Chromium	89.5 5.5	Ingestion Inhalation Dermal External Exposure	71.3 5.7 23.0	<1	Arsenic	52.7	Ingestion Inhalation Dermal	87.3 0.5 12.2

Table D8.65. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 138, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.43E-06	PCB, Total Total PAH	42.0 57.5	Ingestion Inhalation Dermal External Exposure	21.2 2.5 76.3	<1	*no COCs			
Future Child Resident - surface	3.43E-06	PCB, Total Total PAH	42.0 57.5	Ingestion Inhalation Dermal External Exposure	21.2 2.5 76.3	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.66. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.30E-06	Arsenic	97.6	Ingestion Inhalation Dermal External Exposure	25.5 2.6 71.9	<1	*no COCs			
Future Industrial Worker - surface	7.69E-05	Arsenic Chromium	97.6 2.4	Ingestion Inhalation Dermal External Exposure	25.5 2.6 71.9	<1	Arsenic	96.4	Ingestion Inhalation Dermal	28.3 1.3 70.4
Outdoor Worker - surface	1.82E-04	Arsenic Chromium	99.2 0.7	Ingestion Inhalation Dermal External Exposure	76.7 0.8 22.5	1.24	Arsenic	90.6	Ingestion Inhalation Dermal	79.1 0.4 20.5
Outdoor Worker - subsurface	1.84E-04	Arsenic Chromium	99.1 0.8	Ingestion Inhalation Dermal External Exposure	76.6 0.9 22.5	1.48	Arsenic Cobalt	76.9 10.9	Ingestion Inhalation Dermal	81.2 1.4 17.4

Table D8.66. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.30E-06	Arsenic	99.1	See Outdoor Worker (subsurface)		<1	Arsenic	76.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.21E-04	Arsenic Chromium	98.9 1.1	Ingestion Inhalation Dermal External Exposure	54.7 1.2 44.1	<1	Arsenic	95.2	Ingestion Inhalation Dermal	39.6 0.6 59.7
Future Child Resident - surface	3.21E-04	Arsenic Chromium	98.9 1.1	Ingestion Inhalation Dermal External Exposure	54.7 1.2 44.1	4.98	Arsenic Mercury	91.3 7.1	Ingestion Inhalation Dermal	72.6 0.6 26.9
Future Teen Recreational User - surface	4.25E-05	Arsenic	99.2	Ingestion Inhalation Dermal External Exposure	8.4 0.8 90.8	<1	Arsenic	98.8	Ingestion Inhalation Dermal	9.5 0.4 90.1

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.67. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.57E-05	Arsenic Chromium Total PAH	80.7 9.4 9.9	Ingestion Inhalation Dermal External Exposure	21.8 9.6 68.6	<1	*no COCs			
Outdoor Worker - surface	3.35E-05	Arsenic Chromium Total PAH	91.1 3.3 5.7	Ingestion Inhalation Dermal External Exposure	72.8 3.3 23.8	<1	Arsenic	90.7	Ingestion Inhalation Dermal	78.8 0.7 20.5
Outdoor Worker - subsurface	3.15E-05	Arsenic Chromium Total PAH	89.3 4.7 6.0	Ingestion Inhalation Dermal External Exposure	71.6 4.8 23.6	<1	Arsenic	55.1	Ingestion Inhalation Dermal	83.6 3.9 12.5

Table D8.67. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.13E-05	Arsenic Chromium Total PAH	87.6 4.7 7.7	Ingestion Inhalation Dermal External Exposure	50.1 4.8 45.1	<1	Arsenic	95.0	Ingestion Inhalation Dermal	39.3 1.1 59.6
Future Child Resident - surface	6.13E-05	Arsenic Chromium Total PAH	87.6 4.7 7.7	Ingestion Inhalation Dermal External Exposure	50.1 4.8 45.1	<1	Arsenic	91.3	Ingestion Inhalation Dermal	72.1 1.0 26.9
Future Teen Recreational User - surface	8.43E-06	Arsenic Total PAH	84.7 12.1	Ingestion Inhalation Dermal External Exposure	7.4 3.3 89.3	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.68. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.50E-05	Arsenic Chromium	89.5 10.4	Ingestion Inhalation Dermal External Exposure	23.4 10.6 66.0	<1	*no COCs			
Outdoor Worker - surface	3.33E-05	Arsenic Chromium	96.5 3.5	Ingestion Inhalation Dermal External Exposure	74.6 3.5 21.9	<1	Arsenic	90.8	Ingestion Inhalation Dermal	78.9 0.6 20.5
Outdoor Worker - subsurface	3.41E-05	Arsenic Chromium	96.1 3.9	Ingestion Inhalation Dermal External Exposure	74.2 4.0 21.8	<1	Arsenic	76.4	Ingestion Inhalation Dermal	79.1 3.7 17.3

Table D8.68. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.97E-05	Arsenic Chromium	94.9 5.1	Ingestion Inhalation Dermal External Exposure	52.5 5.2 42.4	<1	Arsenic	95.1	Ingestion Inhalation Dermal	39.4 1.0 59.7
Future Child Resident - surface	5.97E-05	Arsenic Chromium	94.9 5.1	Ingestion Inhalation Dermal External Exposure	52.5 5.2 42.4	<1	Arsenic	91.4	Ingestion Inhalation Dermal	72.2 0.9 26.9
Future Teen Recreational User - surface	7.82E-06	Arsenic	96.4	Ingestion Inhalation Dermal External Exposure	8.2 3.7 88.1	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.69. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.39E-05	Arsenic Chromium	83.0 14.3	Ingestion Inhalation Dermal External Exposure	21.9 14.5 63.6	<1	*no COCs			
Outdoor Worker - surface	2.97E-05	Arsenic Chromium	93.5 5.0	Ingestion Inhalation Dermal External Exposure	72.9 5.0 22.1	<1	Arsenic	51.3	Ingestion Inhalation Dermal	84.5 3.9 11.6
Outdoor Worker - subsurface	2.85E-05	Arsenic Chromium	93.6 5.2	Ingestion Inhalation Dermal External Exposure	72.8 5.3 21.9	<1	Arsenic Cobalt	31.8 21.7	Ingestion Inhalation Dermal	89.7 3.1 7.2

Table D8.69. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 180, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.39E-05	Arsenic Chromium Total PAH	90.8 7.2 2.1	Ingestion Inhalation Dermal External Exposure	50.6 7.3 42.1	<1	Arsenic	65.4	Ingestion Inhalation Dermal	51.4 7.6 41.0
Future Child Resident - surface	5.39E-05	Arsenic Chromium Total PAH	90.8 7.2 2.1	Ingestion Inhalation Dermal External Exposure	50.6 7.3 42.1	1.34	Arsenic Iron Manganese Vanadium	52.5 21.0 9.9 9.3	Ingestion Inhalation Dermal	78.7 5.8 15.5
Future Teen Recreational User - surface	7.11E-06	Arsenic	91.5	Ingestion Inhalation Dermal External Exposure	7.8 5.2 87.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.70. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 181

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.34E-06	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.27E-06	*no COCs				<1	Thallium	100.0	Ingestion Inhalation Dermal	100.0
Outdoor Worker - subsurface	2.19E-06					<1	Thallium	99.9	Ingestion Inhalation Dermal	100.0

Table D8.70. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 181 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.23E-06	Chromium Total PAH	45.4 54.6	Ingestion Inhalation Dermal External Exposure	12.1 45.5 42.4	<1	*no COCs			
Future Child Resident - surface	3.23E-06	Chromium Total PAH	45.4 54.6	Ingestion Inhalation Dermal External Exposure	12.1 45.5 42.4	<1	Thallium	100.0	Ingestion Inhalation Dermal	100.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.71. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.10E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.56E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	3.32E-05	Arsenic Cesium-137 Chromium	85.1 9.7 4.3	Ingestion Inhalation Dermal External Exposure	66.2 4.4 19.8 9.6	<1	Arsenic	83.7	Ingestion Inhalation Dermal	80.4 0.6 18.9

Table D8.71. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.08E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	4.08E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.72. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.95E-06	Chromium	76.8	Ingestion Inhalation Dermal External Exposure	1.8 76.8 21.4	<1	*no COCs			
Outdoor Worker - surface	1.66E-06	Chromium	66.7	Ingestion Inhalation Dermal External Exposure	14.6 66.8 18.6	<1	*no COCs			
Outdoor Worker - subsurface	1.78E-06	Chromium	77.6	Ingestion Inhalation Dermal External Exposure	9.8 77.7 12.5	<1	*no COCs			

Table D8.72. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.29E-06	Chromium Total PAH	67.8 32.2	Ingestion Inhalation Dermal External Exposure	7.1 67.9 25.0	<1	*no COCs			
Future Child Resident - surface	4.29E-06	Chromium Total PAH	67.8 32.2	Ingestion Inhalation Dermal External Exposure	7.1 67.9 25.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.73. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.36E-06	Chromium	70.7	Ingestion Inhalation Dermal External Exposure	2.2 71.0 26.8	<1	*no COCs			
Outdoor Worker - surface	2.07E-06	Chromium	59.5	Ingestion Inhalation Dermal External Exposure	17.7 59.7 22.6	<1	*no COCs			
Outdoor Worker - subsurface	2.81E-05	Arsenic Chromium	92.9 4.6	Ingestion Inhalation Dermal External Exposure	72.9 4.7 22.4	<1	Arsenic	81.2	Ingestion Inhalation Dermal	76.9 4.7 18.4

Table D8.73. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.33E-06	Chromium Total PAH	60.6 39.2	Ingestion Inhalation Dermal External Exposure	8.7 60.9 30.4	<1	*no COCs			
Future Child Resident - surface	5.33E-06	Chromium Total PAH	60.6 39.2	Ingestion Inhalation Dermal External Exposure	8.7 60.9 30.4	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.74. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.76E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.30E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.55E-05	Arsenic Chromium	95.1 4.9	Ingestion Inhalation Dermal External Exposure	73.5 4.9 21.6	<1	Arsenic	80.7	Ingestion Inhalation Dermal	81.0 0.7 18.3

Table D8.74. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.41E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.41E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.75. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.32E-06	Chromium	82.1	Ingestion Inhalation Dermal External Exposure	1.3 82.5 16.1	<1	*no COCs			
Outdoor Worker - surface	1.91E-06	Chromium	73.8	Ingestion Inhalation Dermal External Exposure	11.4 74.1 14.5	<1	*no COCs			
Outdoor Worker - subsurface	2.61E-05	Arsenic Cesium-137 Chromium	81.3 11.3 5.4	Ingestion Inhalation Dermal External Exposure	63.8 5.5 19.5 11.2	<1	Arsenic	74.8	Ingestion Inhalation Dermal	82.4 0.7 16.9

Table D8.75. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.94E-06	Chromium Total PAH	74.7 25.0	Ingestion Inhalation Dermal External Exposure	5.5 75.0 19.4	<1	*no COCs			
Future Child Resident - surface	4.94E-06	Chromium Total PAH	74.7 25.0	Ingestion Inhalation Dermal External Exposure	5.5 75.0 19.4	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.76. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.67E-06	Chromium Total PAH	26.0 73.8	Ingestion Inhalation Dermal External Exposure	5.6 26.3 68.1	<1	*no COCs			
Outdoor Worker - surface	6.21E-06	Chromium Total PAH	17.6 82.3	Ingestion Inhalation Dermal External Exposure	36.2 17.8 46.0	<1	*no COCs			
Outdoor Worker - subsurface	3.25E-05	Arsenic Cesium-137 Chromium Total PAH	77.7 6.0 4.2 12.1	Ingestion Inhalation Dermal External Exposure	65.4 4.2 24.4 6.0	<1	Arsenic	86.3	Ingestion Inhalation Dermal	79.7 0.8 19.5

Table D8.76. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.56E-05	Chromium Total PAH	18.3 81.6	Ingestion Inhalation Dermal External Exposure	18.1 18.5 63.4	<1	*no COCs			
Future Child Resident - surface	1.56E-05	Chromium Total PAH	18.3 81.6	Ingestion Inhalation Dermal External Exposure	18.1 18.5 63.4	<1	*no COCs			
Future Teen Recreational User - surface	3.03E-06	Total PAH	91.1	Ingestion Inhalation Dermal External Exposure	1.9 9.0 89.1	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.77. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 7

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.63E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.21E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.17E-05	Arsenic Chromium	94.5 5.4	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic Cobalt	48.0 49.9	Ingestion Inhalation Dermal	88.4 0.8 10.9

Table D8.77. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 7 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.17E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.17E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.78. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 8

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.76E-05	Arsenic Chromium Total PAH	66.0 12.8 20.7	Ingestion Inhalation Dermal External Exposure	18.8 13.4 67.8	<1	*no COCs			
Outdoor Worker - surface	3.40E-05	Arsenic Chromium Total PAH	81.9 4.9 13.1	Ingestion Inhalation Dermal External Exposure	69.0 5.1 25.9	<1	Arsenic Cobalt	40.5 49.7	Ingestion Inhalation Dermal	90.0 0.9 9.2
Outdoor Worker - subsurface	3.32E-05	Arsenic Cesium-137 Chromium Total PAH	80.8 6.4 3.9 8.8	Ingestion Inhalation Dermal External Exposure	66.4 4.0 23.3 6.3	<1	Arsenic Cobalt	40.9 40.2	Ingestion Inhalation Dermal	87.2 3.6 9.2

Table D8.78. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 8 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.47E-05	Arsenic Chromium Total PAH	75.9 6.8 17.1	Ingestion Inhalation Dermal External Exposure	45.8 7.0 47.2	<1	Arsenic	58.2	Ingestion Inhalation Dermal	61.6 1.9 36.5
Future Child Resident - surface	6.47E-05	Arsenic Chromium Total PAH	75.9 6.8 17.1	Ingestion Inhalation Dermal External Exposure	45.8 7.0 47.2	1.65	Arsenic Cobalt Vanadium	42.6 47.9 6.3	Ingestion Inhalation Dermal	86.1 1.3 12.5
Future Teen Recreational User - surface	9.34E-06	Arsenic Total PAH	69.8 25.7	Ingestion Inhalation Dermal External Exposure	6.4 4.6 89.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.79. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 9

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.02E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.50E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.64E-05	Arsenic Chromium	94.3 5.6	Ingestion Inhalation Dermal External Exposure	72.9 5.7 21.4	<1	Arsenic	87.0	Ingestion Inhalation Dermal	79.5 0.8 19.7

Table D8.79. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 9 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.93E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.93E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.80. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 10

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.50E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.11E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.47E-05	Arsenic Chromium	95.7 4.2	Ingestion Inhalation Dermal External Exposure	74.0 4.3 21.7	<1	Arsenic	79.0	Ingestion Inhalation Dermal	78.2 4.0 17.9

Table D8.80. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 10 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.91E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.91E-06	Chromium	99.5	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.81. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 11

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.53E-05	Arsenic Chromium	88.4 11.0	Ingestion Inhalation Dermal External Exposure	23.1 11.8 65.1	<1	*no COCs			
Outdoor Worker - surface	3.38E-05	Arsenic Chromium	96.1 3.7	Ingestion Inhalation Dermal External Exposure	74.2 4.0 21.8	<1	Aluminum Arsenic Cobalt	12.3 24.3 39.0	Ingestion Inhalation Dermal	93.2 1.3 5.5
Outdoor Worker - subsurface	3.51E-05	Arsenic Cesium-137 Chromium	88.9 5.3 4.0	Ingestion Inhalation Dermal External Exposure	69.5 4.2 21.1 5.2	<1	Arsenic Cobalt Iron	28.0 31.5 15.0	Ingestion Inhalation Dermal	91.3 2.3 6.3

Table D8.81. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 11 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.06E-05	Arsenic Chromium	94.3 5.4	Ingestion Inhalation Dermal External Exposure	52.1 5.8 42.1	<1	Arsenic Cobalt	39.5 30.9	Ingestion Inhalation Dermal	72.1 3.1 24.8
Future Child Resident - surface	6.06E-05	Arsenic Chromium	94.3 5.4	Ingestion Inhalation Dermal External Exposure	52.1 5.8 42.1	3.16	Aluminum Arsenic Cobalt Iron Thallium Vanadium	12.2 25.9 38.1 11.4 3.3 6.5	Ingestion Inhalation Dermal	90.4 1.9 7.6
Future Teen Recreational User - surface	7.92E-06	Arsenic	95.9	Ingestion Inhalation Dermal External Exposure	8.1 4.1 87.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.82. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 12

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.34E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.73E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.75E-05	Arsenic Chromium	94.2 5.8	Ingestion Inhalation Dermal External Exposure	72.8 5.8 21.4	<1	Arsenic	71.9	Ingestion Inhalation Dermal	79.6 4.1 16.3

Table D8.82. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 12 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.54E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	4.54E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.83. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 13

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.18E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.61E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.33E-05	Arsenic Chromium	94.5 5.5	Ingestion Inhalation Dermal External Exposure	73.0 5.6 21.4	<1	Arsenic	86.5	Ingestion Inhalation Dermal	79.6 0.8 19.6

Table D8.83. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 13 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.23E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	4.23E-06	Chromium	99.7	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.84. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 14

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.98E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.46E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.61E-05	Arsenic Chromium	94.4 5.6	Ingestion Inhalation Dermal External Exposure	72.9 5.7 21.4	<1	Arsenic	61.4	Ingestion Inhalation Dermal	85.6 0.5 13.9

Table D8.84. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 14 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.84E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.84E-06	Chromium	99.6	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.85. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 15

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.60E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - surface	1.18E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Outdoor Worker - subsurface	2.56E-05	Arsenic Cesium-137 Chromium	86.0 8.8 5.1	Ingestion Inhalation Dermal External Exposure	66.6 5.2 19.5 8.7	<1	Arsenic	99.9	Ingestion Inhalation Dermal	77.0 0.4 22.6

Table D8.85. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 15 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.10E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	3.10E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.86. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 16

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.48E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - surface	1.10E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - subsurface	3.84E-06	Cesium-137 Chromium	66.5 33.4	Ingestion Inhalation Dermal External Exposure	0.7 33.5 65.7	<1	*no COCs			

Table D8.86. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 16 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.88E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.88E-06	Chromium	99.4	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.87. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 17

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.38E-05	Chromium PCB, Total Total PAH Uranium-238	19.7 28.6 38.7 10.6	Ingestion Inhalation Dermal External Exposure	6.0 21.9 60.3 11.7	<1	*no COCs			
Outdoor Worker - surface	1.55E-05	Chromium PCB, Total Total PAH Uranium-238	13.0 29.4 42.0 13.6	Ingestion Inhalation Dermal External Exposure	38.1 14.4 39.8 7.7	<1	*no COCs			
Outdoor Worker - subsurface	3.47E-05	Arsenic Chromium PCB, Total Total PAH Uranium-238	65.0 4.8 13.1 12.2 4.3	Ingestion Inhalation Dermal External Exposure	63.3 5.5 28.8 2.5	<1	Arsenic	48.9	Ingestion Inhalation Dermal	85.7 3.3 11.1

Table D8.87. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 195, EU 17 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.20E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	12.6 27.6 38.7 4.0 17.1	Ingestion Inhalation Dermal External Exposure	15.7 14.0 50.9 19.4	<1	*no COCs			
Future Child Resident - surface	4.20E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	12.6 27.6 38.7 4.0 17.1	Ingestion Inhalation Dermal External Exposure	15.7 14.0 50.9 19.4	<1	*no COCs			
Future Teen Recreational User - surface	6.85E-06	PCB, Total Total PAH	36.2 51.3	Ingestion Inhalation Dermal External Exposure	2.0 8.1 84.9 5.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.88. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.11E-06	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Industrial Worker - surface	1.99E-05	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Outdoor Worker - surface	1.48E-05	Cesium-137	100.0	Ingestion	1.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.9					
Outdoor Worker - subsurface	1.48E-05	Cesium-137	100.0	Ingestion	1.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.9					

Table D8.88. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.00E-04	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Child Resident - surface	1.00E-04	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Teen Recreational User - surface	4.17E-06	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.89. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 487

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.60E-05	Cesium-137	100.0	Ingestion Inhalation Dermal External Exposure	0.1 0.0 99.9	<1	*no COCs			
Outdoor Worker - surface	1.20E-05	Cesium-137	100.0	Ingestion Inhalation Dermal External Exposure	1.1 0.0 98.9	<1	*no COCs			
Outdoor Worker - subsurface	1.20E-05	Cesium-137	100.0	Ingestion Inhalation Dermal External Exposure	1.1 0.0 98.9	<1	*no COCs			

Table D8.89. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 487 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.07E-05	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Child Resident - surface	8.07E-05	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					
Future Teen Recreational User - surface	3.36E-06	Cesium-137	100.0	Ingestion	0.1	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	99.9					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.90. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 492

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.96E-05	Chromium PCB, Total Uranium-238	6.5 44.5 42.7	Ingestion Inhalation Dermal External Exposure	9.0 9.9 40.5 40.7	<1	*no COCs			
Future Industrial Worker - surface	5.28E-04	Arsenic Chromium PCB, Total Uranium-234 Uranium-235 Uranium-238	2.8 6.5 44.5 0.5 2.7 42.7	Ingestion Inhalation Dermal External Exposure	9.0 9.9 40.5 40.7	<1	Uranium	73.2	Ingestion Inhalation Dermal	79.7 2.1 18.2
Outdoor Worker - surface	6.92E-04	Arsenic Chromium PCB, Total Uranium-234 Uranium-235 Uranium-238	5.1 3.7 39.3 2.8 1.8 47.2	Ingestion Inhalation Dermal External Exposure	48.6 5.6 22.8 23.0	2.34	Arsenic Uranium	9.4 87.7	Ingestion Inhalation Dermal	97.4 0.3 2.3
Outdoor Worker - subsurface	6.95E-04	Arsenic Cesium-137 Chromium PCB, Total Uranium-234 Uranium-235 Uranium-238	5.1 0.4 3.7 39.1 2.7 1.8 47.0	Ingestion Inhalation Dermal External Exposure	48.4 5.5 22.7 23.3	2.34	Arsenic Uranium	9.4 87.7	Ingestion Inhalation Dermal	97.4 0.3 2.3

Table D8.90. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 492 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	8.69E-06	PCB, Total Uranium-238	39.1 47.0	See Outdoor Worker (subsurface)		<1	Uranium	87.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.02E-03	Arsenic Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	3.1 3.3 0.1 0.2 34.2 0.6 3.6 54.9	Ingestion Inhalation Dermal External Exposure	14.2 5.0 27.2 53.7	1.03	Arsenic Uranium	17.7 78.9	Ingestion Inhalation Dermal	87.2 0.8 12.1
Future Child Resident - surface	2.02E-03	Arsenic Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	3.1 3.3 0.1 0.2 34.2 0.6 3.6 54.9	Ingestion Inhalation Dermal External Exposure	14.2 5.0 27.2 53.7	8.72	Arsenic Uranium Vanadium	10.3 86.8 1.3	Ingestion Inhalation Dermal	96.3 0.4 3.3
Future Teen Recreational User - surface	2.10E-04	Arsenic Chromium PCB, Total Uranium-235 Uranium-238	3.9 3.0 70.1 1.4 21.3	Ingestion Inhalation Dermal External Exposure	3.2 4.5 70.9 21.4	<1	Arsenic Uranium	46.5 48.3	Ingestion Inhalation Dermal	52.6 1.4 46.0

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.91. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 493

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.70E-05	Chromium PCB, Total Total PAH Uranium-238	12.8 8.1 49.5 19.0	Ingestion Inhalation Dermal External Exposure	6.5 14.5 52.7 26.3	<1	*no COCs			
Outdoor Worker - surface	1.96E-05	Chromium PCB, Total Total PAH Uranium-238	8.3 8.2 52.5 23.9	Ingestion Inhalation Dermal External Exposure	39.9 9.3 33.9 16.9	<1	Cobalt Manganese	61.5 20.2	Ingestion Inhalation Dermal	90.6 9.4
Outdoor Worker - subsurface	5.06E-05	Arsenic Cesium-137 Chromium PCB, Total Total PAH Uranium-238	56.2 5.0 3.2 3.2 20.4 9.3	Ingestion Inhalation Dermal External Exposure	59.0 3.6 25.9 11.5	<1	Arsenic Cobalt Manganese	19.1 47.8 15.7	Ingestion Inhalation Dermal	88.3 7.4 4.3

Table D8.91. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 493 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Cobalt	47.8	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.85E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	7.3 6.6 3.9 7.0 44.0 3.6 27.2	Ingestion Inhalation Dermal External Exposure	13.8 8.2 39.4 38.7	<1	Cobalt Manganese	52.2 31.4	Ingestion Inhalation Dermal	75.0 25.0
Future Child Resident - surface	5.85E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	7.3 6.6 3.9 7.0 44.0 3.6 27.2	Ingestion Inhalation Dermal External Exposure	13.8 8.2 39.4 38.7	2.81	Aluminum Cobalt Manganese Nickel Vanadium	7.0 58.6 23.7 5.3 3.7	Ingestion Inhalation Dermal	85.7 14.3
Future Teen Recreational User - surface	7.84E-06	Total PAH	70.9	Ingestion Inhalation Dermal External Exposure	2.2 5.7 80.0 12.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.92. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 517

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.13E-05	Chromium Neptunium-237 PCB, Total Uranium-238	14.4 34.9 23.6 20.2	Ingestion Inhalation Dermal External Exposure	4.4 16.3 20.3 59.0	<1	*no COCs			
Outdoor Worker - surface	1.15E-05	Chromium Neptunium-237 PCB, Total Uranium-238	10.5 28.4 26.8 28.8	Ingestion Inhalation Dermal External Exposure	30.4 11.9 14.8 42.9	<1	*no COCs			
Outdoor Worker - subsurface	1.15E-05	Chromium Neptunium-237 PCB, Total Uranium-238	10.5 28.4 26.8 28.8	Ingestion Inhalation Dermal External Exposure	30.4 11.9 14.8 42.9	<1	*no COCs			

Table D8.92. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 517 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.59E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-235 Uranium-238	6.9 4.0 43.1 17.0 4.4 24.5	Ingestion Inhalation Dermal External Exposure	6.2 7.8 12.8 73.2	<1	*no COCs			
Future Child Resident - surface	4.59E-05	Chromium Cobalt-60 Neptunium-237 PCB, Total Uranium-235 Uranium-238	6.9 4.0 43.1 17.0 4.4 24.5	Ingestion Inhalation Dermal External Exposure	6.2 7.8 12.8 73.2	<1	Nickel	95.7	Ingestion Inhalation Dermal	92.5 7.5
Future Teen Recreational User - surface	3.41E-06	PCB, Total	49.0	Ingestion Inhalation Dermal External Exposure	2.0 9.9 47.1 41.1	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.93. Summary of Risk Characterization Adjusted for Dermal Absorption for AOC 541

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.85E-05	Chromium	2.6	Ingestion	9.4	<1	*no COCs			
		PCB, Total	30.9	Inhalation	5.1					
		Total PAH	3.8	Dermal	30.2					
		Uranium-235	4.3	External	55.3					
		Uranium-238	56.4	Exposure						
Future Industrial Worker - surface	1.04E-03	Americium-241	0.1	Ingestion	9.4	1.1	Uranium	96.5	Ingestion	96.5
		Cesium-137	1.1	Inhalation	5.1				Inhalation	3.2
		Chromium	2.6	Dermal	30.2				Dermal	0.3
		PCB, Total	30.9	External	55.3					
		Total PAH	3.8	Exposure						
		Uranium-234	0.7							
		Uranium-235	4.3							
		Uranium-238	56.4							
Outdoor Worker - surface	1.40E-03	Americium-241	0.3	Ingestion	50	7.59	Uranium	97.7	Ingestion	99.6
		Cesium-137	0.6	Inhalation	2.8				Inhalation	0.3
		Chromium	1.4	Dermal	16.7				Dermal	0.0
		PCB, Total	26.7	External	30.6					
		Total PAH	3.4	Exposure						
		Uranium-234	3.6							
		Uranium-235	2.8							
		Uranium-238	61.1							
Outdoor Worker - subsurface	1.55E-03	Americium-241	0.3	Ingestion	50.2	8.94	Arsenic	1.5	Ingestion	99.2
		Arsenic	1.4	Inhalation	2.7		Uranium	96.0	Inhalation	0.4
		Cesium-137	0.5	Dermal	16.2				Dermal	0.4
		Chromium	1.5	External	30.9					
		PCB, Total	24.5	Exposure						
		Total PAH	4.2							
		Uranium-234	3.3							
		Uranium-235	3.2							
		Uranium-238	61.0							

Table D8.93. Summary of Risk Characterization Adjusted for Dermal Absorption for AOC 541 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.94E-05	PCB, Total	24.5	See Outdoor Worker (subsurface)		2.79	Uranium	96.0	See Outdoor Worker (subsurface) for %	
		Uranium-238	61.0							
		Americium-241	0.2	Ingestion	11.9	3.02	Uranium	97.3	Ingestion	98.7
Future Adult Resident - surface	4.34E-03	Cesium-137	1.3	Inhalation	2.3				Inhalation	1.1
		Chromium	1.2	Dermal	18.6				Dermal	0.2
		Cobalt-60	0.1	External	67.1					
		Neptunium-237	0.0	Exposure						
		PCB, Total	21.9							
		Total PAH	2.8							
		Uranium-234	0.7							
		Uranium-235	5.1							
		Uranium-238	66.7							
Future Child Resident - surface	4.34E-03	Arsenic	28.8	Ingestion	11.9	27.98	Aluminum	0.7	Ingestion	99.4
		Cesium-137	21.7	Inhalation	2.3		Iron	1.0	Inhalation	0.6
		Chromium	0.3	Dermal	18.6		Uranium	97.6	Dermal	0.0
		Napthalene	0.2	External	67.1					
		Neptunium-237	0.8	Exposure						
		PCB, Total	13.8							
		Plutonium-239/240	0.1							
		Thorium-230	0.2							
		Total PAH	10.3							
		Uranium-234	1.3							
		Uranium-235	2.8							
		Uranium-238	19.8							
Future Teen Recreational User - surface	3.64E-04	Arsenic	35.0	Ingestion	3.5	<1	Uranium	95.6	Ingestion	95.6
		Cesium-137	8.3	Inhalation	2.6				Inhalation	3.2
		PCB, Total	27.0	Dermal	60.5				Dermal	1.2
		Total PAH	20.3	External	33.4					
		Uranium-235	1.1	Exposure						
		Uranium-238	7.3							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.94. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 561, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.73E-06	Uranium-238	61.2	Ingestion	12.4	<1	*no COCs			
				Inhalation	3.5					
				Dermal	22.6					
				External Exposure	61.5					
Future Industrial Worker - surface	1.02E-04	Arsenic	16.2	Ingestion	12.4	<1	Arsenic	45.1	Ingestion	49.7
		Chromium	2.8	Inhalation	3.5				Inhalation	17.3
		Cobalt-60	3.9	Dermal	22.6				Dermal	32.9
		PCB, Total	5.4	External Exposure	61.5					
		Total PAH	6.5							
		Uranium-235	3.4							
		Uranium-238	61.2							
Outdoor Worker - surface	1.56E-04	Arsenic	25.5	Ingestion	57.5	<1	Arsenic	27.6	Ingestion	90.5
		Chromium	1.3	Inhalation	1.7		Cobalt	13.9	Inhalation	3.3
		Cobalt-60	1.9	Dermal	11		Iron	11.3	Dermal	6.2
		PCB, Total	4.1	External Exposure	29.8		Uranium	34.1		
		Total PAH	5.2							
		Uranium-234	1.8							
		Uranium-235	1.9							
		Uranium-238	58.1							
Outdoor Worker - subsurface	1.70E-04	Arsenic	23.1	Ingestion	56.1	<1	Arsenic	25.1	Ingestion	90.7
		Cesium-137	1.3	Inhalation	1.6		Cobalt	13.2	Inhalation	3.7
		Chromium	1.3	Dermal	12.5		Iron	10.5	Dermal	5.7
		Cobalt-60	1.7	External Exposure	29.8		Uranium	31.3		
		PCB, Total	3.6							
		Total PAH	9.4							
		Uranium-234	1.8							
		Uranium-235	1.8							
		Uranium-238	55.9							

Table D8.94. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 561, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.13E-06	Uranium-238	24.5	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.60E-04	Arsenic	15.3	Ingestion	16.7	<1	Arsenic	42.2	Ingestion	65.9
		Chromium	1.2	Inhalation	1.5		Uranium	24.9	Inhalation	7.6
		Cobalt-60	4.4	Dermal	12.9				Dermal	26.5
		PCB, Total	3.5	External	69.0					
		Total PAH	4.4	Exposure						
		Uranium-234	0.4							
		Uranium-235	3.8							
		Uranium-238	66.9							
Future Child Resident - surface	4.60E-04	Arsenic	15.3	Ingestion	16.7	3.47	Arsenic	29.0	Ingestion	86.5
		Chromium	1.2	Inhalation	1.5		Cobalt	13.4	Inhalation	5.0
		Cobalt-60	4.4	Dermal	12.9		Iron	10.8	Dermal	8.5
		PCB, Total	3.5	External	69.0		Manganese	8.7		
		Total PAH	4.4	Exposure			Uranium	32.6		
		Uranium-234	0.4							
		Uranium-235	3.8							
		Uranium-238	66.9							
Future Teen Recreational User - surface	3.18E-05	Arsenic	29.4	Ingestion	5.6	<1	Arsenic	76.1	Ingestion	25.7
		PCB, Total	11.0	Inhalation	2.0				Inhalation	9.0
		Total PAH	13.8	Dermal	50.9				Dermal	65.3
		Uranium-238	39.1	External Exposure	41.6					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.95. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 561, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.31E-05	PCB, Total	21.2	Ingestion	9.9	<1	*no COCs			
		Total PAH	9.9	Inhalation	4.1					
		Uranium-235	4.3	Dermal	29.8					
		Uranium-238	57	External Exposure	56.3					
Future Industrial Worker - surface	4.13E-04	Arsenic	3.2	Ingestion	9.9	<1	Uranium	61.4	Ingestion	75.1
		Cesium-137	1.1	Inhalation	4.1				Inhalation	8.7
		Chromium	2.3	Dermal	29.8				Dermal	16.1
		Cobalt-60	0.4	External	56.3					
		PCB, Total	21.2	Exposure						
		Total PAH	9.9							
		Uranium-234	0.5							
		Uranium-235	4.3							
		Uranium-238	57							
Outdoor Worker - surface	5.66E-04	Arsenic	5.5	Ingestion	51.3	2.07	Arsenic	9.4	Ingestion	96.7
		Cesium-137	0.6	Inhalation	2.2		Cobalt	6.4	Inhalation	1.2
		Chromium	1.2	Dermal	16.1		Uranium	77.5	Dermal	2.2
		Cobalt-60	0.2	External	30.4					
		PCB, Total	17.9	Exposure						
		Total PAH	8.9							
		Uranium-234	2.5							
		Uranium-235	2.8							
		Uranium-238	60.3							
Outdoor Worker - subsurface	5.51E-04	Arsenic	5.5	Ingestion	51.2	2.11	Arsenic	9.0	Ingestion	96.8
		Cesium-137	0.6	Inhalation	2.3		Cobalt	6.0	Inhalation	1.2
		Chromium	1.4	Dermal	16.4		Uranium	77.2	Dermal	2.1
		Cobalt-60	0.2	External	30.1					
		PCB, Total	18.7	Exposure						
		Total PAH	8.6							
		Uranium-234	2.5							
		Uranium-235	2.7							
		Uranium-238	59.7							

Table D8.95. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 561, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	6.89E-06	PCB, Total	18.7	See Outdoor Worker (subsurface)		<1	Uranium	77.2	See Outdoor Worker (subsurface) for %	
		Uranium-238	59.7							
Future Adult Resident - surface	1.74E-03	Arsenic	3.2	Ingestion	12.9	<1	Arsenic	17.5	Ingestion	85.5
		Cesium-137	1.4	Inhalation	1.8		Uranium	68.9	Inhalation	3.3
		Chromium	1.1	Dermal	18.1				Dermal	11.1
		Cobalt-60	0.5	External	67.2					
		PCB, Total	14.7	Exposure						
		Total PAH	7.2							
		Uranium-234	0.5							
		Uranium-235	5.2							
		Uranium-238	66.3							
Future Child Resident - surface	1.74E-03	Arsenic	3.2	Ingestion	12.9	7.75	Antimony	2.2	Ingestion	95.1
		Chromium	1.4	Inhalation	1.8		Arsenic	10.2	Inhalation	1.8
		Cobalt-60	1.1	Dermal	18.1		Cobalt	6.4	Dermal	3.0
		PCB, Total	0.5	External	67.2		Manganese	2.7		
		Total PAH	14.7	Exposure			Uranium	76.3		
		Uranium-234	7.2							
		Uranium-235	0.5							
		Uranium-238	5.2							
			66.3							
Future Teen Recreational User - surface	1.43E-04	Arsenic	5.1	Ingestion	3.8	<1	*no COCs			
		Chromium	1.2	Inhalation	2.1					
		PCB, Total	38.4	Dermal	60					
		Total PAH	18.9	External	34.1					
		Uranium-235	2.6	Exposure						
		Uranium-238	32.7							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.96. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.61E-06	Uranium-238	100.0	Ingestion Inhalation Dermal External Exposure	11.2 0.3 88.5	<1	*no COCs			
Outdoor Worker - surface	2.33E-06	Uranium-238	100.0	Ingestion Inhalation Dermal External Exposure	54.7 0.2 45.2	<1	Uranium	100.0	Ingestion Inhalation Dermal	99.8 0.2
Outdoor Worker - subsurface	9.15E-05	Arsenic Cesium-137 Chromium PCB, Total Uranium-235 Uranium-238	31.1 4.3 8.4 13.6 1.4 41.2	Ingestion Inhalation Dermal External Exposure	52.3 9.1 14.5 24.0	<1	Arsenic Uranium	40.2 59.6	Ingestion Inhalation Dermal	90.6 0.3 9.1

Table D8.96. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.14E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.89E-06	Uranium-238	100.0	Ingestion	9.2	<1	*no COCs			
				Inhalation	0.1					
				Dermal						
				External Exposure	90.8					
Future Child Resident - surface	7.89E-06	Uranium-238	100.0	Ingestion	9.2	<1	Uranium	100.0	Ingestion	99.6
				Inhalation	0.1				Inhalation	0.4
				Dermal					Dermal	
				External Exposure	90.8					
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.97. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.10E-05	Uranium-235	6.0	Ingestion	11.1	<1	*no COCs			
		Uranium-238	91.0	Inhalation	0.5					
				Dermal	1.9					
				External Exposure	86.5					
Future Industrial Worker - surface	3.76E-04	PCB, Total	2.2	Ingestion	11.1	<1	*no COCs			
		Uranium-234	0.8	Inhalation	0.5					
		Uranium-235	6.0	Dermal	1.9					
		Uranium-238	91.0	External Exposure	86.5					
Outdoor Worker - surface	5.44E-04	PCB, Total	1.8	Ingestion	54.6	<1	*no COCs			
		Uranium-234	3.5	Inhalation	0.2					
		Uranium-235	3.6	Dermal	1.0					
		Uranium-238	91.1	External Exposure	44.2					
Outdoor Worker - subsurface	5.47E-04	Cesium-137	0.6	Ingestion	54.3	<1	*no COCs			
		PCB, Total	1.8	Inhalation	0.2					
		Uranium-234	3.4	Dermal	1.0					
		Uranium-235	3.6	External Exposure	44.5					
		Uranium-238	90.6							

Table D8.97. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	6.84E-06	Uranium-238	90.6	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.83E-03	PCB, Total Uranium-234 Uranium-235 Uranium-238	1.4 0.6 6.2 91.8	Ingestion Inhalation Dermal External Exposure	9.4 0.1 1.0 89.5	<1	*no COCs			
Future Child Resident - surface	1.83E-03	PCB, Total Uranium-234 Uranium-235 Uranium-238	1.4 0.6 6.2 91.8	Ingestion Inhalation Dermal External Exposure	9.4 0.1 1.0 89.5	<1	*no COCs			
Future Teen Recreational User - surface	7.82E-05	PCB, Total Uranium-235 Uranium-238	6.8 6.0 86.8	Ingestion Inhalation Dermal External Exposure	6.0 0.3 6.5 87.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.98. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.31E-05	Chromium PCB, Total Total PAH Uranium-238	9.7 9.8 28.4 49.0	Ingestion Inhalation Dermal External Exposure	8.3 10.6 34.7 46.5	<1	*no COCs			
Outdoor Worker - surface	1.66E-05	PCB, Total Total PAH Uranium-238	8.9 27.3 56.0	Ingestion Inhalation Dermal External Exposure	46.6 6.2 20.2 27.1	<1	*no COCs			
Outdoor Worker - subsurface	1.57E-05	PCB, Total Total PAH Uranium-238	9.4 28.9 59.3	Ingestion Inhalation Dermal External Exposure	49.3 0.6 21.4 28.7	<1	*no COCs			

Table D8.98. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	5.11E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	4.8 7.4 22.1 4.1 61.6	Ingestion Inhalation Dermal External Exposure	12.1 5.2 22.7 59.9	<1	*no COCs			
Future Child Resident - surface	5.11E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	4.8 7.4 22.1 4.1 61.6	Ingestion Inhalation Dermal External Exposure	12.1 5.2 22.7 59.9	<1	Uranium	99.9	Ingestion Inhalation Dermal	99.6 0.4
Future Teen Recreational User - surface	4.84E-06	Total PAH Uranium-238	50.6 26.3	Ingestion Inhalation Dermal External Exposure	3.0 5.2 65.4 26.4	<1	*no COCs			

There are no subsurface data available for assessment.
Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.99. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	2.86E-06	Chromium Uranium-238	54.0 46.0	Ingestion Inhalation Dermal External Exposure	5.1 54.1 40.7	<1	*no COCs			
Outdoor Worker - surface	3.05E-06	Chromium Uranium-238	37.5 62.5	Ingestion Inhalation Dermal External Exposure	34.2 37.6 28.2	<1	*no COCs			
Outdoor Worker - subsurface	7.47E-06	Cesium-137 Chromium Uranium-238	57.0 15.3 27.6	Ingestion Inhalation Dermal External Exposure	15.7 15.4 68.9	<1	*no COCs			

Table D8.99. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	9.48E-06	Chromium Uranium-238	31.7 68.3	Ingestion Inhalation Dermal External Exposure	6.3 31.7 62.0	<1	*no COCs			
Future Child Resident - surface	9.48E-06	Chromium Uranium-238	31.7 68.3	Ingestion Inhalation Dermal External Exposure	6.3 31.7 62.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.100. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.85E-06	Uranium-238	72.1	Ingestion Inhalation Dermal External Exposure	9.8 11.0 10.7 68.5	<1	*no COCs			
Future Industrial Worker - surface	5.09E-05	Chromium PCB, Total Total PAH Uranium-235 Uranium-238	10.0 9.9 2.3 4.7 72.1	Ingestion Inhalation Dermal External Exposure	9.8 11.0 10.7 68.5	<1	*no COCs			
Outdoor Worker - surface	6.94E-05	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	5.4 8.4 2.1 4.4 3.0 76.7	Ingestion Inhalation Dermal External Exposure	51.1 5.9 5.8 37.2	<1	Uranium	99.9	Ingestion Inhalation Dermal	99.8 0.2
Outdoor Worker - subsurface	7.27E-05	Cesium-137 Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	4.5 5.2 8.1 2.0 4.2 2.9 73.2	Ingestion Inhalation Dermal External Exposure	48.8 5.7 5.6 40.0	<1	Uranium	99.9	Ingestion Inhalation Dermal	99.8 0.2

Table D8.100. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.23E-04	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	4.4 6.7 1.6 0.8 5.4 81.0	Ingestion Inhalation Dermal External Exposure	10.0 4.8 6.3 78.9	<1	*no COCs			
Future Child Resident - surface	2.23E-04	Chromium PCB, Total Total PAH Uranium-234 Uranium-235 Uranium-238	4.4 6.7 1.6 0.8 5.4 81.0	Ingestion Inhalation Dermal External Exposure	10.0 4.8 6.3 78.9	<1	Uranium	99.9	Ingestion Inhalation Dermal	99.6 0.4
Future Teen Recreational User - surface	1.27E-05	PCB, Total Uranium-238	25.0 57.3	Ingestion Inhalation Dermal External Exposure	4.6 7.9 30.0 57.5	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.101. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.30E-05	Uranium-238	91.7	Ingestion	11.2	<1	*no COCs			
				Inhalation	0.3					
				Dermal						
				External Exposure	88.4					
Future Industrial Worker - surface	2.32E-04	Uranium-234	0.9	Ingestion	11.2	<1	*no COCs			
		Uranium-235	7.4	Inhalation	0.3					
		Uranium-238	91.7	Dermal						
				External Exposure	88.4					
Outdoor Worker - surface	3.38E-04	Uranium-234	4.2	Ingestion	54.8	<1	*no COCs			
		Uranium-235	4.4	Inhalation	0.2					
		Uranium-238	91.4	Dermal						
				External Exposure	45.0					
Outdoor Worker - subsurface	3.38E-04	Uranium-234	4.2	Ingestion	54.8	<1	*no COCs			
		Uranium-235	4.4	Inhalation	0.2					
		Uranium-238	91.4	Dermal						
				External Exposure	45.0					

Table D8.101. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 562, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	4.22E-06	Uranium-238	91.4	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.14E-03	Uranium-234 Uranium-235 Uranium-238	0.7 7.6 91.7	Ingestion Inhalation Dermal External Exposure	9.2 0.1 90.7	<1	*no COCs			
Future Child Resident - surface	1.14E-03	Uranium-234 Uranium-235 Uranium-238	0.7 7.6 91.7	Ingestion Inhalation Dermal External Exposure	9.2 0.1 90.7	<1	*no COCs			
Future Teen Recreational User - surface	4.61E-05	Uranium-235 Uranium-238	7.8 91.7	Ingestion Inhalation Dermal External Exposure	6.3 0.2 93.5	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.102. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 563, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.50E-05	Chromium PCB, Total Uranium-238	62.9 26.3 10.8	Ingestion Inhalation Dermal External Exposure	2.9 64.8 22.7 9.6	<1	*no COCs			
Outdoor Worker - surface	1.39E-05	Chromium PCB, Total Uranium-238	50.3 32.8 16.9	Ingestion Inhalation Dermal External Exposure	22.5 51.8 18.1 7.6	<1	*no COCs			
Outdoor Worker - subsurface	3.54E-05	Cesium-137 Chromium PCB, Total Uranium-238	7.1 23.1 61.7 7.1	Ingestion Inhalation Dermal External Exposure	28.9 26.0 34.0 11.1	<1	*no COCs			

Table D8.102. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 563, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.79E-05	Chromium PCB, Total Uranium-238	48.4 30.6 21.0	Ingestion Inhalation Dermal External Exposure	8.0 49.8 23.0 19.1	<1	*no COCs			
Future Child Resident - surface	3.79E-05	Chromium PCB, Total Uranium-238	48.4 30.6 21.0	Ingestion Inhalation Dermal External Exposure	8.0 49.8 23.0 19.1	<1	*no COCs			
Future Teen Recreational User - surface	4.52E-06	Chromium PCB, Total	38.1 54.8	Ingestion Inhalation Dermal External Exposure	1.5 39.3 52.6 6.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.103. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 563, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	8.39E-06	Cesium-137	89.6	Ingestion	1.3	<1	*no COCs			
				Inhalation	0.0					
				Dermal						
				External Exposure	98.7					
Outdoor Worker - surface	6.89E-06	Cesium-137	81.5	Ingestion	11.0	<1	*no COCs			
		Uranium-238	18.5	Inhalation	0.0					
				Dermal						
				External Exposure	89.0					
Outdoor Worker - subsurface	6.89E-06	Cesium-137	81.5	Ingestion	11.0	<1	*no COCs			
		Uranium-238	18.5	Inhalation	0.0					
				Dermal						
				External Exposure	89.0					

Table D8.103. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 563, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.22E-05	Cesium-137 Uranium-238	89.8 10.2	Ingestion Inhalation Dermal External Exposure	1.0 0.0 99.0	<1	*no COCs			
Future Child Resident - surface	4.22E-05	Cesium-137 Uranium-238	89.8 10.2	Ingestion Inhalation Dermal External Exposure	1.0 0.0 99.0	<1	*no COCs			
Future Teen Recreational User - surface	1.75E-06	Cesium-137	90.1	Ingestion Inhalation Dermal External Exposure	0.7 0.0 99.3	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.104. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 564

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.90E-06	Arsenic	61.9	Ingestion	18.9	<1	*no COCs			
				Inhalation	4.8					
				Dermal	58.3					
				External Exposure	18.0					
Future Industrial Worker - surface	6.97E-05	Arsenic	61.9	Ingestion	18.9	<1	Arsenic	80.8	Ingestion	38.8
		Cesium-137	10.3	Inhalation	4.8				Inhalation	1.2
		Chromium	3.6	Dermal	58.3				Dermal	60.1
		PCB, Total	14.8	External Exposure	18.0					
		Uranium-238	7.0							
Outdoor Worker - surface	1.35E-04	Arsenic	76.5	Ingestion	69.1	1.08	Arsenic	60.2	Ingestion	85.9
		Cesium-137	4.0	Inhalation	1.8		Iron	16.9	Inhalation	0.3
		Chromium	1.4	Dermal	22.2		Thallium	9.5	Dermal	13.9
		PCB, Total	8.8	External Exposure	6.8					
		Thorium-230	1.7							
		Uranium-234	1.8							
		Uranium-238	5.2							
Outdoor Worker - subsurface	1.36E-04	Arsenic	76.3	Ingestion	69.0	1.12	Arsenic	57.7	Ingestion	86.3
		Cesium-137	4.0	Inhalation	2.0		Iron	16.2	Inhalation	0.4
		Chromium	1.5	Dermal	22.2		Thallium	9.1	Dermal	13.3
		PCB, Total	8.8	External Exposure	6.9					
		Thorium-230	1.7							
		Uranium-234	1.8							
		Uranium-238	5.4							

Table D8.104. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 564 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.70E-06	Arsenic	76.3	See Outdoor Worker (subsurface)		<1	Arsenic	57.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.86E-04	Arsenic Cesium-137 Chromium PCB, Total Thorium-230 Uranium-234 Uranium-235 Uranium-238	63.9 12.7 1.7 10.6 0.5 0.5 1.7 8.4	Ingestion Inhalation Dermal External Exposure	39.2 2.3 36.5 22.1	<1	Arsenic	75.4	Ingestion Inhalation Dermal	51.3 0.5 48.2
Future Child Resident - surface	2.86E-04	Arsenic Cesium-137 Chromium PCB, Total Thorium-230 Uranium-234 Uranium-235 Uranium-238	63.9 12.7 1.7 10.6 0.5 0.5 1.7 8.4	Ingestion Inhalation Dermal External Exposure	39.2 2.3 36.5 22.1	4.20	Arsenic Iron Thallium Uranium Vanadium	62.3 15.9 9.0 5.9 4.9	Ingestion Inhalation Dermal	80.9 0.4 18.7
Future Teen Recreational User - surface	3.39E-05	Arsenic Cesium-137 PCB, Total	71.5 4.5 19.0	Ingestion Inhalation Dermal External Exposure	6.8 1.8 83.6 7.7	<1	Arsenic	91.8	Ingestion Inhalation Dermal	14.4 0.4 85.2

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.105. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface	<1E-6					<1	*no COCs			

Table D8.105. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.106. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface		*no COCs					*no COCs			
Future Industrial Worker - surface		*no COCs					*no COCs			
Outdoor Worker - surface		*no COCs					*no COCs			
Outdoor Worker - subsurface							*no COCs			

Table D8.106. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface				See Outdoor Worker (subsurface)					See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface		*no COCs					*no COCs			
Future Child Resident - surface		*no COCs					*no COCs			
Future Teen Recreational User - surface		*no COCs					*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.107. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.26E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	 100.0 	<1	*no COCs			
Outdoor Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.74E-06	Chromium Uranium-238	46.6 53.4	Ingestion Inhalation Dermal External Exposure	29.2 46.6 24.1	<1	*no COCs			

Table D8.107. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.44E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Child Resident - surface	2.44E-06	Chromium	100.0	Ingestion Inhalation Dermal External Exposure	100.0	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.108. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.16E-06	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.29E-06	*no COCs				<1	*no COCs			
Outdoor Worker - subsurface	2.72E-05	Arsenic	96.6	Ingestion Inhalation Dermal External Exposure	76.5 0.1 21.9 1.5	<1	Arsenic	78.2	Ingestion Inhalation Dermal	81.0 1.3 17.7

Table D8.108. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 567, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.08E-06	Chromium Uranium-238	25.7 74.3	Ingestion Inhalation Dermal External Exposure	6.8 25.7 67.5	<1	*no COCs			
Future Child Resident - surface	4.08E-06	Chromium Uranium-238	25.7 74.3	Ingestion Inhalation Dermal External Exposure	6.8 25.7 67.5	<1	Aluminum	99.9	Ingestion Inhalation Dermal	93.0 7.0
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.109. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.06E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.90E-05	Arsenic Chromium PCB, Total Technetium-99	58.1 11.1 14.1 5.9	Ingestion Inhalation Dermal External Exposure	22.3 12.4 54.9 10.4	<1	*no COCs			
Outdoor Worker - surface	4.10E-05	Arsenic Chromium PCB, Total Technetium-99 Uranium-238	64.6 3.8 7.5 17.1 3.5	Ingestion Inhalation Dermal External Exposure	73.4 4.2 18.8 3.6	<1	Arsenic	43.5	Ingestion Inhalation Dermal	89.6 0.5 9.8
Outdoor Worker - subsurface	4.71E-05	Arsenic Chromium Cobalt-60 PCB, Total Technetium-99 Uranium-238	57.6 3.4 2.2 6.6 14.9 11.3	Ingestion Inhalation Dermal External Exposure	69.4 3.9 16.7 10.0	<1	Arsenic Iron Nickel Uranium	19.1 23.7 15.3 33.6	Ingestion Inhalation Dermal	93.2 2.5 4.3

Table D8.109. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	7.33E-05	Americium-241 Arsenic Chromium Neptunium-237 PCB, Total Technetium-99 Uranium-238	1.6 63.6 5.6 5.4 10.7 6.4 6.7	Ingestion Inhalation Dermal External Exposure	43.8 6.2 36.4 13.5	<1	Arsenic	61.4	Ingestion Inhalation Dermal	60.3 1.2 38.5
Future Child Resident - surface	7.33E-05	Americium-241 Arsenic Chromium Neptunium-237 PCB, Total Technetium-99 Uranium-238	1.6 63.6 5.6 5.4 10.7 6.4 6.7	Ingestion Inhalation Dermal External Exposure	43.8 6.2 36.4 13.5	1.46	Arsenic Iron Uranium	45.7 23.6 21.1	Ingestion Inhalation Dermal	85.7 0.8 13.5
Future Teen Recreational User - surface	8.80E-06	Arsenic PCB, Total	70.4 19.0	Ingestion Inhalation Dermal External Exposure	7.8 4.8 82.6 4.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.110. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.79E-06	Uranium-238	48.7	Ingestion	15	<1	*no COCs			
				Inhalation	4					
				Dermal	26.3					
				External Exposure	54.7					
Future Industrial Worker - surface	6.77E-05	Arsenic	21.5	Ingestion	15	<1	*no COCs			
		Chromium	3.3	Inhalation	4					
		Neptunium-237	4.2	Dermal	26.3					
		PCB, Total	3.1	External Exposure	54.7					
		Total PAH	8.4							
		Uranium-234	2.5							
		Uranium-235	7.5							
		Uranium-238	48.7							
Outdoor Worker - surface	1.15E-04	Arsenic	30.5	Ingestion	62.9	<1	Arsenic	22.3	Ingestion	91.7
		Chromium	1.4	Inhalation	1.7		Iron	18.9	Inhalation	3.2
		Neptunium-237	2.0	Dermal	11.5		Nickel	12.7	Dermal	5.1
		PCB, Total	2.1	External Exposure	23.9		Uranium	34.8		
		Thorium-230	2.4							
		Total PAH	6.1							
		Uranium-234	10.0							
		Uranium-235	3.8							
		Uranium-238	41.7							
Outdoor Worker - subsurface	1.83E-04	Arsenic	19.4	Ingestion	58	1.3	Arsenic	17.0	Ingestion	93.2
		Chromium	1.0	Inhalation	1.9		Iron	16.7	Inhalation	2.8
		Neptunium-237	2.8	Dermal	15.2		Mercury	7.9	Dermal	4.0
		PCB, Total	16.9	External Exposure	24.9		Nickel	11.8		
		Thorium-230	1.9				Uranium	32.5		
		Total PAH	2.6							
		Uranium-234	9.3							
		Uranium-235	4.1							
		Uranium-238	41.9							

Table D8.110. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.28E-06			See Outdoor Worker (subsurface)		<1	Uranium	32.5	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.00E-04	Arsenic	20.6	Ingestion	20.9	<1	Arsenic	35.7	Ingestion	69.8
		Chromium	1.4	Inhalation	1.7		Uranium	26.6	Inhalation	7.8
		Neptunium-237	4.8	Dermal	15.2				Dermal	22.4
		PCB, Total	2.0	External	62.2					
		Thorium-230	0.6	Exposure						
		Total PAH	5.8							
		Uranium-234	2.2							
		Uranium-235	8.5							
		Uranium-238	54.1							
Future Child Resident - surface	3.00E-04	Arsenic	20.6	Ingestion	20.9	3.75	Antimony	3.2	Ingestion	88.1
		Chromium	1.4	Inhalation	1.7		Arsenic	23.6	Inhalation	4.9
		Neptunium-237	4.8	Dermal	15.2		Iron	18.1	Dermal	6.9
		PCB, Total	2.0	External	62.2		Manganese	7.2		
		Thorium-230	0.6	Exposure			Nickel	12.5		
		Total PAH	5.8				Uranium	33.5		
		Uranium-234	2.2							
		Uranium-235	8.5							
		Uranium-238	54.1							
Future Teen Recreational User - surface	2.21E-05	Arsenic	37.0	Ingestion	6.5	<1	Arsenic	66.1	Ingestion	29.8
		PCB, Total	5.9	Inhalation	2.1				Inhalation	10.0
		Total PAH	17.0	Dermal	56.2				Dermal	60.3
		Uranium-235	4.8	External	35.1					
		Uranium-238	29.6	Exposure						

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.111. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.49E-06	PCB, Total	73.9	Ingestion	10.5	<1	*no COCs			
				Inhalation	9.1					
				Dermal	79.2					
				External Exposure	1.3					
Future Industrial Worker - surface	6.23E-05	Arsenic	20.9	Ingestion	10.5	<1	*no COCs			
		Chromium	3.7	Inhalation	9.1					
		PCB, Total	73.9	Dermal	79.2					
				External Exposure	1.3					
Outdoor Worker - surface	8.76E-05	Arsenic	35.7	Ingestion	52.9	<1	Arsenic	22.1	Ingestion	92.3
		Chromium	2.0	Inhalation	4.8		Iron	19.6	Inhalation	2.7
		PCB, Total	60.9	Dermal	41.7		Nickel	11.9	Dermal	5.0
		Uranium-238	1.5	External Exposure	0.7		Uranium	28.6		
Outdoor Worker - subsurface	1.13E-04	Arsenic	40.5	Ingestion	56.3	1.30	Arsenic	22.0	Ingestion	92.7
		Chromium	1.5	Inhalation	3.8		Cobalt	14.6	Inhalation	2.3
		PCB, Total	47.5	Dermal	35.4		Iron	17.7	Dermal	5.0
		Uranium-234	1.4	External Exposure	4.4		Nickel	9.3		
		Uranium-238	8.1				Uranium	19.5		

Table D8.111. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.42E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.99E-04	Arsenic Chromium PCB, Total Uranium-238	27.6 2.3 67.9 2.2	Ingestion Inhalation Dermal External Exposure	29.0 5.6 63.4 2.0	<1	Arsenic Uranium	35.7 22.1	Ingestion Inhalation Dermal	71.0 6.6 22.4
Future Child Resident - surface	1.99E-04	Arsenic Chromium PCB, Total Uranium-238	27.6 2.3 67.9 2.2	Ingestion Inhalation Dermal External Exposure	29.0 5.6 63.4 2.0	3.37	Arsenic Iron Manganese Mercury Nickel Uranium	23.4 18.9 5.9 9.5 11.8 27.6	Ingestion Inhalation Dermal	89.0 4.2 6.9
Future Teen Recreational User - surface	3.68E-05	Arsenic PCB, Total	19.9 78.5	Ingestion Inhalation Dermal External Exposure	3.2 2.8 93.5 0.4	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.112. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.07E-05	PCB, Total	18.4	Ingestion	12.5	<1	*no COCs			
		Uranium-235	10.6	Inhalation	3.0					
		Uranium-238	51.9	Dermal	23.1					
				External Exposure	61.5					
Future Industrial Worker - surface	1.91E-04	Arsenic	7.0	Ingestion	12.5	<1	*no COCs			
		Chromium	1.2	Inhalation	3.0					
		Neptunium-237	5.2	Dermal	23.1					
		PCB, Total	18.4	External	61.5					
		Total PAH	2.2	Exposure						
		Uranium-234	3.1							
		Uranium-235	10.6							
		Uranium-238	51.9							
Outdoor Worker - surface	2.93E-04	Arsenic	10.9	Ingestion	57.8	1.04	Arsenic	19.2	Ingestion	94.8
		Chromium	0.6	Inhalation	1.4		Iron	18.5	Inhalation	0.8
		Neptunium-237	2.8	Dermal	11.1		Nickel	12.8	Dermal	4.3
		PCB, Total	13.9	External	29.7		Uranium	41.5		
		Thorium-230	1.3	Exposure						
		Total PAH	1.8							
		Uranium-234	13.6							
		Uranium-235	6.0							
		Uranium-238	49.1							
Outdoor Worker - subsurface	2.49E-04	Arsenic	12.1	Ingestion	56.7	1.36	Arsenic	13.7	Ingestion	94.8
		Chromium	0.6	Inhalation	1.7		Cobalt	12.6	Inhalation	2.1
		Neptunium-237	2.5	Dermal	15.0		Iron	14.2	Dermal	3.1
		PCB, Total	20.6	External	26.7		Nickel	9.8		
		Thorium-230	1.0	Exposure			Uranium	31.7		
		Total PAH	1.6							
		Uranium-234	12.2							
		Uranium-235	5.4							
		Uranium-238	44.1							

Table D8.112. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	3.11E-06	Uranium-238	44.1	See Outdoor Worker (subsurface)		<1	Uranium	31.7	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.43E-04	Arsenic	6.7	Ingestion	15.0	<1	Arsenic	32.8	Ingestion	77.3
		Chromium	0.5	Inhalation	1.2		Uranium	34.0	Inhalation	2.1
		Neptunium-237	5.9	Dermal	13.4				Dermal	20.6
		PCB, Total	12.3	External	70.4					
		Thorium-230	0.3	Exposure						
		Total PAH	1.5							
		Uranium-234	2.8							
		Uranium-235	12.1							
		Uranium-238	57.9							
Future Child Resident - surface	8.43E-04	Arsenic	6.7	Ingestion	15.0	3.92	Antimony	3.5	Ingestion	92.7
		Chromium	0.5	Inhalation	1.2		Arsenic	20.6	Inhalation	1.3
		Neptunium-237	5.9	Dermal	13.4		Copper	2.9	Dermal	6.1
		PCB, Total	12.3	External	70.4		Iron	18.1		
		Thorium-230	0.3	Exposure			Nickel	12.9		
		Total PAH	1.5				Uranium	40.6		
		Uranium-234	2.8							
		Uranium-235	12.1							
		Uranium-238	57.9							
Future Teen Recreational User - surface	5.96E-05	Arsenic	12.6	Ingestion	5.2	<1	*no COCs			
		Neptunium-237	3.5	Inhalation	1.7					
		PCB, Total	37.1	Dermal	51.7					
		Total PAH	4.7	External	41.5					
		Uranium-235	7.1	Exposure						
		Uranium-238	33.1							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.113. Summary of Risk Characterization for Dermal Absorption for SWMU 14, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.40E-06	Uranium-238	57.4	Ingestion	14.6	<1	*no COCs			
				Inhalation	2.5					
				Dermal	16.7					
				External Exposure	66.1					
Future Industrial Worker - surface	9.64E-05	Arsenic	13.6	Ingestion	14.6	<1	*no COCs			
		Chromium	1.6	Inhalation	2.5					
		Neptunium-237	6.7	Dermal	16.7					
		PCB, Total	5.5	External Exposure	66.1					
		Thorium-230	1.0							
		Total PAH	2.1							
		Uranium-234	2.9							
		Uranium-235	8.7							
		Uranium-238	57.4							
Outdoor Worker - surface	1.61E-04	Arsenic	19.6	Ingestion	62.1	1.18	Arsenic	16.6	Ingestion	94.0
		Chromium	0.7	Inhalation	1.1		Cobalt	13.9	Inhalation	1.8
		Neptunium-237	3.3	Dermal	7.4		Iron	16.5	Dermal	4.2
		PCB, Total	3.8	External Exposure	29.3		Mercury	10.7		
		Technetium-99	1.1				Uranium	25.7		
		Thorium-230	3.9							
		Total PAH	1.5							
		Uranium-234	11.5							
		Uranium-235	4.5							
		Uranium-238	49.9							
Outdoor Worker - subsurface	1.74E-04	Arsenic	17.5	Ingestion	56.9	1.16	Arsenic	16.3	Ingestion	93.9
		Chromium	0.7	Inhalation	2.1		Cobalt	11.2	Inhalation	2.1
		Neptunium-237	3.0	Dermal	19.5		Iron	16.8	Dermal	4.0
		PCB, Total	27.0	External Exposure	21.5		Mercury	10.9		
		Technetium-99	0.8				Uranium	26.2		
		Thorium-230	2.8							
		Total PAH	1.1							
		Uranium-234	8.2							
		Uranium-235	3.2							
		Uranium-238	35.5							

Table D8.113. Summary of Risk Characterization for Dermal Absorption for SWMU 14, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	2.18E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.43E-04	Arsenic	12.5	Ingestion	17.2	<1	Arsenic	28.1	Ingestion	75.6
		Chromium	0.7	Inhalation	1.0		Uranium	20.8	Inhalation	4.6
		Neptunium-237	7.3	Dermal	9.3				Dermal	19.7
		PCB, Total	3.5	External	72.5					
		Technetium-99	0.3	Exposure						
		Thorium-230	0.9							
		Total PAH	1.4							
		Uranium-234	2.4							
		Uranium-235	9.5							
		Uranium-238	61.4							
Future Child Resident - surface	4.43E-04	Arsenic	12.5	Ingestion	17.2	4.48	Arsenic	17.8	Ingestion	91.3
		Chromium	0.7	Inhalation	1.0		Cobalt	13.6	Inhalation	2.8
		Neptunium-237	7.3	Dermal	9.3		Iron	16.0	Dermal	5.9
		PCB, Total	3.5	External	72.5		Manganese	3.5		
		Technetium-99	0.3	Exposure			Mercury	10.4		
		Thorium-230	0.9				Nickel	7.1		
		Total PAH	1.4				Uranium	25.1		
		Uranium-234	2.4							
		Uranium-235	9.5							
		Uranium-238	61.4							
Future Teen Recreational User - surface	2.69E-05	Arsenic	37.0	Ingestion	6.9	<1	*no COCs			
		PCB, Total	5.9	Inhalation	1.6					
		Total PAH	17.0	Dermal	41.9					
		Uranium-235	4.8	External	49.7					
		Uranium-238	29.6	Exposure						

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.114. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 6

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.97E-06	PCB, Total Uranium-238	30.0 33.7	Ingestion Inhalation Dermal External Exposure	7.9 19.1 25.9 47.1	<1	*no COCs			
Future Industrial Worker - surface	8.87E-05	Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	16.7 11.0 30.0 2.0 6.5 33.7	Ingestion Inhalation Dermal External Exposure	7.9 19.1 25.9 47.1	<1	*no COCs			
Outdoor Worker - surface	1.10E-04	Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	9.9 7.3 28.0 10.9 4.5 39.3	Ingestion Inhalation Dermal External Exposure	45.2 11.4 15.4 28.0	<1	Nickel Uranium	19.6 74.7	Ingestion Inhalation Dermal	98.7 1.2 0.1
Outdoor Worker - subsurface	1.21E-04	Arsenic Chromium Neptunium-237 PCB, Total Uranium-234 Uranium-235 Uranium-238	20.9 8.9 5.1 25.4 7.5 3.2 28.9	Ingestion Inhalation Dermal External Exposure	50.8 10.2 18.8 20.3	1.08	Arsenic Nickel Uranium	14.7 16.3 62.1	Ingestion Inhalation Dermal	94.6 2.0 3.4

Table D8.114. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 6 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.52E-06			See Outdoor Worker (subsurface)		<1	Uranium	62.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	3.39E-04	Chromium	8.5	Ingestion	10.9	<1	Uranium	72.8	Ingestion	95.7
		Neptunium-237	14.5	Inhalation	9.7				Inhalation	3.6
		PCB, Total	23.1	Dermal	17.4				Dermal	0.7
		Uranium-234	2.1	External Exposure	62.1					
		Uranium-235	8.5							
		Uranium-238	43.3							
Future Child Resident - surface	3.39E-04	Chromium	8.5	Ingestion	10.9	3.33	Nickel	20.0	Ingestion	98.0
		Neptunium-237	14.5	Inhalation	9.7		Uranium	74.2	Inhalation	1.8
		PCB, Total	23.1	Dermal	17.4				Dermal	0.2
		Uranium-234	2.1	External Exposure	62.1					
		Uranium-235	8.5							
		Uranium-238	43.3							
Future Teen Recreational User - surface	2.88E-05	Chromium	9.4	Ingestion	3.2	<1	*no COCs			
		Neptunium-237	7.1	Inhalation	10.7					
		PCB, Total	58.0	Dermal	55.7					
		Uranium-235	4.1	External Exposure	30.4					
		Uranium-238	20.6							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.115. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 7

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.27E-06	PCB, Total	53.1	Ingestion	10.3	<1	*no COCs			
				Inhalation	6.9					
				Dermal	58.1					
				External Exposure	24.8					
Future Industrial Worker - surface	7.63E-05	Arsenic	14.9	Ingestion	10.3	<1	*no COCs			
		Chromium	2.8	Inhalation	6.9					
		Neptunium-237	7.2	Dermal	58.1					
		PCB, Total	53.1	External Exposure	24.8					
		Total PAH	1.4							
		Uranium-235	3.2							
		Uranium-238	16.4							
Outdoor Worker - surface	1.06E-04	Arsenic	25.6	Ingestion	52.4	<1	Arsenic	19.1	Ingestion	93.8
		Chromium	1.5	Inhalation	3.7		Nickel	25.1	Inhalation	1.4
		Neptunium-237	4.3	Dermal	30.8		Uranium	43.4	Dermal	4.7
		PCB, Total	44.1	External Exposure	13.1					
		Total PAH	1.2							
		Uranium-234	4.2							
		Uranium-235	2.0							
		Uranium-238	17.1							
Outdoor Worker - subsurface	9.90E-05	Arsenic	27.4	Ingestion	52.4	<1	Arsenic	18.3	Ingestion	93.1
		Chromium	1.6	Inhalation	3.9		Nickel	24.3	Inhalation	2.5
		Neptunium-237	3.6	Dermal	32.9		Uranium	42.0	Dermal	4.5
		PCB, Total	47.4	External Exposure	10.8					
		Total PAH	1.0							
		Uranium-234	3.5							
		Uranium-235	1.6							
		Uranium-238	13.8							

Table D8.115. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 7 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.24E-06			See Outdoor Worker (subsurface)		<1	Uranium	42.0	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.79E-04	Arsenic	17.2	Ingestion	21.4	<1	Arsenic	31.8	Ingestion	74.5
		Chromium	1.5	Inhalation	3.6		Uranium	34.6	Inhalation	3.7
		Neptunium-237	9.9	Dermal	40.8				Dermal	21.9
		PCB, Total	42.7	External Exposure	34.2					
		Total PAH	1.2							
		Uranium-234	1.0							
		Uranium-235	4.4							
		Uranium-238	22.1							
Future Child Resident - surface	2.79E-04	Arsenic	17.2	Ingestion	21.4	3.37	Arsenic	20.4	Ingestion	91.2
		Chromium	1.5	Inhalation	3.6		Mercury	9.9	Inhalation	2.2
		Neptunium-237	9.9	Dermal	40.8		Nickel	25.1	Dermal	6.6
		PCB, Total	42.7	External Exposure	34.2		Uranium	42.2		
		Total PAH	1.2							
		Uranium-234	1.0							
		Uranium-235	4.4							
		Uranium-238	22.1							
Future Teen Recreational User - surface	3.71E-05	Arsenic	17.2	Ingestion	3.4	<1	*no COCs			
		Neptunium-237	3.1	Inhalation	2.6					
		PCB, Total	68.5	Dermal	83.3					
		Uranium-238	6.7	External Exposure	10.7					

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.116. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 8

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	2.69E-06	PCB, Total	55.5	Ingestion	10.9	<1	*no COCs			
				Inhalation	7.3					
				Dermal	67.4					
				External Exposure	14.3					
Future Industrial Worker - surface	4.80E-05	Arsenic	23.8	Ingestion	10.9	<1	*no COCs			
		Chromium	3.2	Inhalation	7.3					
		Neptunium-237	6.8	Dermal	67.4					
		PCB, Total	55.5	External Exposure	14.3					
		Total PAH	2.2							
		Uranium-238	7.2							
Outdoor Worker - surface	6.90E-05	Arsenic	39.8	Ingestion	54.1	<1	Arsenic	21.7	Ingestion	94.1
		Chromium	1.6	Inhalation	3.8		Nickel	15.6	Inhalation	1.0
		Neptunium-237	3.9	Dermal	34.7		Uranium	49.5	Dermal	4.9
		PCB, Total	44.7	External Exposure	7.4					
		Total PAH	1.9							
		Uranium-238	7.3							
Outdoor Worker - subsurface	6.82E-05	Arsenic	43.1	Ingestion	55.2	<1	Arsenic	20.3	Ingestion	94.5
		Chromium	1.8	Inhalation	4.0		Mercury	11.2	Inhalation	0.9
		Neptunium-237	3.0	Dermal	35.4		Nickel	13.7	Dermal	4.6
		PCB, Total	45.2	External Exposure	5.3		Uranium	52.3		
		Uranium-238	5.0							

Table D8.116. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 8 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1	Uranium	52.3	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.69E-04	Arsenic Chromium Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	28.5 1.7 9.6 46.2 1.9 1.8 10.1	Ingestion Inhalation Dermal External Exposure	26.5 4.1 49.0 20.4	<1	Arsenic Uranium	36.3 39.5	Ingestion Inhalation Dermal	74.8 2.5 22.8
Future Child Resident - surface	1.69E-04	Arsenic Chromium Neptunium-237 PCB, Total Total PAH Uranium-235 Uranium-238	28.5 1.7 9.6 46.2 1.9 1.8 10.1	Ingestion Inhalation Dermal External Exposure	26.5 4.1 49.0 20.4	2.97	Arsenic Mercury Nickel Uranium	23.3 11.3 15.7 48.2	Ingestion Inhalation Dermal	91.6 1.5 6.8
Future Teen Recreational User - surface	2.56E-05	Arsenic PCB, Total	25.1 65.3	Ingestion Inhalation Dermal External Exposure	3.6 2.5 88.2 5.6	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.117. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 9

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.57E-05	Neptunium-237	4.1	Ingestion	13.1	<1	*no COCs			
		PCB, Total	3.7	Inhalation	0.9					
		Uranium-234	4.4	Dermal	5.0					
		Uranium-235	13.9	External	81.1					
		Uranium-238	71.0	Exposure						
Future Industrial Worker -	6.77E-05	Arsenic	1.4	Ingestion	13.1	<1	Uranium	65.3	Ingestion	77.4
		Cesium-137	0.5	Inhalation	0.9				Inhalation	4.8
		Chromium	0.2	Dermal	5.0				Dermal	17.7
		Neptunium-237	4.1	External	81.1					
		PCB, Total	3.7	Exposure						
		Total PAH	0.8							
		Uranium-234	4.4							
		Uranium-235	13.9							
		Uranium-238	71.0							
Outdoor Worker - surface	1.15E-04	Arsenic	2.2	Ingestion	59.2	2.12	Arsenic	10.0	Ingestion	97.1
		Cesium-137	0.3	Inhalation	0.4		Nickel	8.1	Inhalation	0.6
		Chromium	0.1	Dermal	2.3		Uranium	80.2	Dermal	2.3
		Neptunium-237	2.1	External	38.1					
		PCB, Total	2.7	Exposure						
		Technetium-99	0.2							
		Total PAH	0.6							
		Uranium-234	18.8							
		Uranium-235	7.7							
		Uranium-238	65.4							
Outdoor Worker - subsurface	1.83E-04	Arsenic	2.1	Ingestion	59.1	2.12	Arsenic	9.9	Ingestion	97.1
		Cesium-137	0.3	Inhalation	0.4		Nickel	8.2	Inhalation	0.6
		Chromium	0.1	Dermal	2.3		Uranium	80.3	Dermal	2.3
		Neptunium-237	2.1	External	38.1					
		PCB, Total	2.7	Exposure						
		Technetium-99	0.2							
		Total PAH	0.6							
		Uranium-234	18.8							
		Uranium-235	7.7							
		Uranium-238	65.4							

Table D8.117. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 9 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.96E-05	Uranium-234	18.8	See Outdoor Worker (subsurface)		<1	Uranium	80.3	See Outdoor Worker (subsurface) for %	
		Uranium-235	7.7							
		Uranium-238	65.4							
Future Adult Resident - surface	4.76E-03	Arsenic	1.3	Ingestion	11.7	<1	Arsenic	18.6	Ingestion	86.2
		Cesium-137	0.6	Inhalation	0.3		Uranium	71.6	Inhalation	1.8
		Chromium	0.1	Dermal	2.7				Dermal	12.0
		Neptunium-237	4.3	External	85.3					
		PCB, Total	2.3	Exposure						
		Technetium-99	0.0							
		Total PAH	0.5							
		Uranium-234	3.6							
		Uranium-235	14.6							
		Uranium-238	72.9							
Future Child Resident - surface	4.76E-03	Arsenic	1.3	Ingestion	11.7	7.9	Arsenic	10.8	Ingestion	95.7
		Cesium-137	0.6	Inhalation	0.3		Nickel	8.3	Inhalation	1.0
		Chromium	0.1	Dermal	2.7		Uranium	79.3	Dermal	3.3
		Neptunium-237	4.3	External	85.3					
		PCB, Total	2.3	Exposure						
		Technetium-99	0.0							
		Total PAH	0.5							
		Uranium-234	3.6							
		Uranium-235	14.6							
		Uranium-238	72.9							
Future Teen Recreational User - surface	2.20E-04	Arsenic	3.6							
		Cesium-137	0.5	Ingestion	6.8	<1	Arsenic	48.3	Ingestion	51.6
		Neptunium-237	3.8	Inhalation	0.6				Inhalation	3.2
		PCB, Total	10.4	Dermal	15.7				Dermal	45.2
		Total PAH	2.5	External	76.9					
		Uranium-234	2.3	Exposure						
		Uranium-235	13.1							
		Uranium-238	63.7							

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.118. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 10

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	5.98E-06	PCB, Total	46.8	Ingestion	10.0	<1	*no COCs			
		Uranium-238	22.5	Inhalation	4.9					
				Dermal	52.1					
				External Exposure	33.0					
Future Industrial Worker - surface	1.07E-04	Arsenic	10.6	Ingestion	10.0	<1	*no COCs			
		Chromium	1.3	Inhalation	4.9					
		Neptunium-237	9.1	Dermal	52.1					
		PCB, Total	46.8	External	33.0					
		Total PAH	4.3	Exposure						
		Uranium-234	1.2							
		Uranium-235	4.2							
		Uranium-238	22.5							
Outdoor Worker - surface	1.47E-04	Arsenic	18.4	Ingestion	51.6	1.06	Arsenic	15.9	Ingestion	95.7
		Chromium	0.7	Inhalation	2.6		Iron	12.8	Inhalation	0.6
		Neptunium-237	5.5	Dermal	28.0		Mercury	27.4	Dermal	3.6
		PCB, Total	39.4	External	17.8		Nickel	10.3		
		Total PAH	3.8	Exposure			Uranium	31.6		
		Uranium-234	5.8							
		Uranium-235	2.6							
		Uranium-238	23.7							
Outdoor Worker - subsurface	1.30E-04	Arsenic	21.4	Ingestion	51.6	1.08	Arsenic	16.0	Ingestion	94.7
		Chromium	0.8	Inhalation	3.0		Iron	12.3	Inhalation	1.7
		Neptunium-237	4.8	Dermal	31.2		Mercury	26.6	Dermal	3.6
		PCB, Total	44.3	External	14.2		Nickel	9.8		
		Total PAH	3.3	Exposure			Uranium	29.9		
		Uranium-234	5.2							
		Uranium-235	2.4							
		Uranium-238	17.7							

Table D8.118. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 14, EU 10 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.62E-06			See Outdoor Worker (subsurface)		<1	Uranium	29.9	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	4.06E-04	Arsenic	11.8	Ingestion	18.6	<1	Arsenic	28.1	Ingestion	93.9
		Chromium	0.7	Inhalation	2.5		Mercury	23.1	Inhalation	1.0
		Neptunium-237	12.0	Dermal	35.2		Uranium	26.7	Dermal	5.1
		PCB, Total	36.2	External	43.8					
		Total PAH	3.4	Exposure						
		Uranium-234	1.2							
		Uranium-235	5.5							
		Uranium-238	29.1							
Future Child Resident - surface	4.06E-04	Arsenic	11.8	Ingestion	18.6	3.98	Arsenic	17.2	Ingestion	93.9
		Chromium	0.7	Inhalation	2.5		Iron	12.6	Inhalation	1.0
		Neptunium-237	12.0	Dermal	35.2		Mercury	26.9	Dermal	5.1
		PCB, Total	36.2	External	43.8		Nickel	10.5		
		Total PAH	3.4	Exposure			Uranium	31.0		
		Uranium-234	1.2							
		Uranium-235	5.5							
		Uranium-238	29.1							
Future Teen Recreational User - surface	4.89E-05	Arsenic	13.0	Ingestion	3.4	<1	*no COCs			
		Neptunium-237	4.2	Inhalation	1.9					
		PCB, Total	64.2	Dermal	79.5					
		Total PAH	6.2	External	15.2					
		Uranium-238	9.8	Exposure						

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.119. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 518

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.71E-05	Total PAH	99.3	Ingestion	7.6	<1	*no COCs			
				Inhalation	0.2					
				Dermal	92.1					
				External Exposure	0.1					
Future Industrial Worker - surface	6.63E-04	PCB, Total	0.5	Ingestion	7.6	<1	*no COCs			
		Total PAH	99.3	Inhalation	0.2					
				Dermal	92.1					
				External Exposure	0.1					
Outdoor Worker - surface	8.09E-04	PCB, Total	0.5	Ingestion	44.0	<1	Uranium	73.1	Ingestion	97.8
		Total PAH	99.3	Inhalation	0.1				Inhalation	0.5
		Uranium-238	0.2	Dermal	55.8				Dermal	1.7
				External Exposure	0.1					
Outdoor Worker - subsurface	8.25E-04	Arsenic	1.9	Ingestion	44.6	<1	Uranium	57.1	Ingestion	93.2
		PCB, Total	0.5	Inhalation	0.1				Inhalation	0.5
		Total PAH	97.4	Dermal	55.2				Dermal	6.3
		Uranium-238	0.2	External Exposure	0.1					

Table D8.119. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 518 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.03E-05	Total PAH	97.4	See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.02E-03	Carbazole PCB, Total Total PAH Uranium-238	0.1 0.5 99.2 0.2	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.5 0.2	<1	*no COCs			
Future Child Resident - surface	2.02E-03	Carbazole PCB, Total Total PAH Uranium-238	0.1 0.5 99.2 0.2	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.5 0.2	1.28	Cobalt Uranium	23.1 72.5	Ingestion Inhalation Dermal	96.8 0.8 2.4
Future Teen Recreational User - surface	4.36E-04	PCB, Total Total PAH	0.5 99.4	Ingestion Inhalation Dermal External Exposure	2.1 0.1 97.8 0.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.120. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 1

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	1.04E-06	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.87E-05	Cesium-137 Chromium Neptunium-237 Uranium-238	59.9 5.6 13.0 12.4	Ingestion Inhalation Dermal External Exposure	5.7 6.2 2.7 85.4	<1	*no COCs			
Outdoor Worker - surface	2.06E-05	Cesium-137 Neptunium-237 Thorium-230 Uranium-238	40.5 9.7 25.1 16.3	Ingestion Inhalation Dermal External Exposure	36.8 4.1 1.8 57.3	<1	Mercury	43.5	Ingestion Inhalation Dermal	99.1 0.9
Outdoor Worker - subsurface	4.05E-05	Arsenic Cesium-137 Chromium Neptunium-237 Thorium-230 Uranium-238	52.5 18.3 3.6 4.0 11.5 7.8	Ingestion Inhalation Dermal External Exposure	57.6 3.9 12.8 25.7	<1	Arsenic Cobalt Mercury	21.7 20.6 20.2	Ingestion Inhalation Dermal	92.1 3.0 4.9

Table D8.120. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 1 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	8.83E-05	Cesium-137 Chromium Neptunium-237 Thorium-230 Total PAH Uranium-235 Uranium-238	63.7 2.3 13.8 3.6 1.9 1.8 12.9	Ingestion Inhalation Dermal External Exposure	5.1 2.5 1.4 91.0	<1	*no COCs			
Future Child Resident - surface	8.83E-05	Cesium-137 Chromium Neptunium-237 Thorium-230 Total PAH Uranium-235 Uranium-238	63.7 2.3 13.8 3.6 1.9 1.8 12.9	Ingestion Inhalation Dermal External Exposure	5.1 2.5 1.4 91.0	1.05	Iron Mercury Nickel	27.1 43.3 17.2	Ingestion Inhalation Dermal	98.6 1.4
Future Teen Recreational User - surface	4.02E-06	Cesium-137	58.3	Ingestion Inhalation Dermal External Exposure	3.0 5.1 8.6 83.2	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.121. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 2

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	8.92E-06	Chromium Total PAH Uranium-238	24.8 60.0 11.7	Ingestion Inhalation Dermal External Exposure	5.9 25.3 55.4 13.4	<1	*no COCs			
Outdoor Worker - surface	9.94E-06	Chromium Total PAH Uranium-238	16.4 65.8 15.3	Ingestion Inhalation Dermal External Exposure	37.5 16.8 36.8 8.9	<1	Mercury	51.8	Ingestion Inhalation Dermal	95.3 4.7
Outdoor Worker - subsurface	7.95E-05	Arsenic Chromium Radium-226 Total PAH Uranium-238	29.9 2.1 59.5 6.6 1.7	Ingestion Inhalation Dermal External Exposure	30.1 2.1 10.5 57.3	<1	Arsenic Mercury	35.7 33.1	Ingestion Inhalation Dermal	88.5 3.4 8.1

Table D8.121. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 2 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.72E-05	Chromium Neptunium-237 Total PAH Uranium-238	15.8 5.1 60.0 18.9	Ingestion Inhalation Dermal External Exposure	15.1 16.1 46.6 22.2	<1	*no COCs			
Future Child Resident - surface	2.72E-05	Chromium Neptunium-237 Total PAH Uranium-238	15.8 5.1 60.0 18.9	Ingestion Inhalation Dermal External Exposure	15.1 16.1 46.6 22.2	1.01	Manganese Mercury Nickel Uranium	11.0 50.4 21.4 16.8	Ingestion Inhalation Dermal	92.6 7.4
Future Teen Recreational User - surface	4.20E-06	Total PAH	83.9	Ingestion Inhalation Dermal External Exposure	2.1 9.8 82.2 6.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.122. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 3

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.26E-06	Chromium Total PAH	30.9 46.8	Ingestion Inhalation Dermal External Exposure	6.0 31.7 43.2 19.2	<1	*no COCs			
Outdoor Worker - surface	4.77E-06	Total PAH Uranium-238	51.1 28.1	Ingestion Inhalation Dermal External Exposure	37.8 20.9 28.6 12.7	<1	*no COCs			
Outdoor Worker - subsurface	2.95E-05	Arsenic Chromium Total PAH Uranium-238	85.4 5.5 5.2 3.9	Ingestion Inhalation Dermal External Exposure	70.4 5.6 22.3 1.7	<1	Arsenic	46.8	Ingestion Inhalation Dermal	88.3 1.1 10.6

Table D8.122. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 3 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.32E-05	Chromium Total PAH Uranium-238	19.3 46.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 19.8 35.7 31.2	<1	*no COCs			
Future Child Resident - surface	1.32E-05	Chromium Total PAH Uranium-238	19.3 46.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 19.8 35.7 31.2	<1	Nickel	54.5	Ingestion Inhalation Dermal	95.7 4.3
Future Teen Recreational User - surface	1.74E-06	Total PAH	75.4	Ingestion Inhalation Dermal External Exposure	2.2 14.1 73.8 9.9	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.123. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 4

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	1.76E-05	Chromium Neptunium-237 Total PAH Uranium-238	7.2 15.5 52.9 20.9	Ingestion Inhalation Dermal External Exposure	6.6 7.5 48.8 37.1	<1	*no COCs			
Outdoor Worker - surface	2.05E-05	Neptunium-237 Total PAH Uranium-238	11.0 55.6 26.1	Ingestion Inhalation Dermal External Exposure	40.4 4.8 31.1 23.7	<1	Mercury	53.8	Ingestion Inhalation Dermal	98.7 1.3
Outdoor Worker - subsurface	4.37E-05	Arsenic Chromium Neptunium-237 Total PAH Uranium-238	51.6 3.7 5.2 26.1 12.2	Ingestion Inhalation Dermal External Exposure	58.8 3.8 26.3 11.1	<1	Arsenic Mercury	28.6 22.8	Ingestion Inhalation Dermal	90.7 2.6 6.8

Table D8.123. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 4 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	6.58E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	3.7 20.8 43.2 4.7 27.5	Ingestion Inhalation Dermal External Exposure	12.4 3.9 33.5 50.1	<1	*no COCs			
Future Child Resident - surface	6.58E-05	Chromium Neptunium-237 Total PAH Uranium-235 Uranium-238	3.7 20.8 43.2 4.7 27.5	Ingestion Inhalation Dermal External Exposure	12.4 3.9 33.5 50.1	<1	Mercury Nickel Uranium	53.4 25.3 13.3	Ingestion Inhalation Dermal	98.0 2.0
Future Teen Recreational User - surface	7.81E-06	Total PAH	78.7	Ingestion Inhalation Dermal External Exposure	2.3 3.1 77.0 17.6	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.124. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 5

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	9.20E-06	Chromium Total PAH	13.3 71.1	Ingestion Inhalation Dermal External Exposure	6.5 13.6 65.6 14.3	<1	*no COCs			
Outdoor Worker - surface	1.06E-05	Total PAH Uranium-238	75.3 11.7	Ingestion Inhalation Dermal External Exposure	40.0 8.7 42.1 9.2	<1	*no COCs			
Outdoor Worker - subsurface	3.49E-05	Arsenic Chromium Total PAH Uranium-238	68.8 3.5 22.9 3.5	Ingestion Inhalation Dermal External Exposure	65.3 3.6 28.4 2.8	<1	Arsenic	38.6	Ingestion Inhalation Dermal	88.5 2.8 8.7

Table D8.124. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 520, EU 5 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.94E-05	Chromium Neptunium-237 Total PAH Uranium-238	8.1 9.8 67.8 14.3	Ingestion Inhalation Dermal External Exposure	16.5 8.2 52.7 22.6	<1	*no COCs			
Future Child Resident - surface	2.94E-05	Chromium Neptunium-237 Total PAH Uranium-238	8.1 9.8 67.8 14.3	Ingestion Inhalation Dermal External Exposure	16.5 8.2 52.7 22.6	<1	Nickel	76.7	Ingestion Inhalation Dermal	94.1 5.9
Future Teen Recreational User - surface	4.82E-06	Total PAH	89.3	Ingestion Inhalation Dermal External Exposure	2.1 4.7 87.4 5.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.125. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 81

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	4.90E-05	PCB, Total	97.3	Ingestion	6.8	<1	*no COCs			
				Inhalation	7.3					
				Dermal	85.8					
				External Exposure	0.1					
Future Industrial Worker - surface	8.75E-04	Arsenic	1.2	Ingestion	6.8	1.17	Uranium	92.5	Ingestion	93.6
		Chromium	0.3	Inhalation	7.3				Inhalation	2.4
		PCB, Total	97.3	Dermal	85.8				Dermal	4.0
		Total PAH	1.1	External Exposure	0.1					
		Uranium-238	0.2							
Outdoor Worker - surface	1.03E-03	Arsenic	2.4	Ingestion	41.1	7.85	Arsenic	2.0	Ingestion	99.3
		Chromium	0.2	Inhalation	4.6		Uranium	96.1	Inhalation	0.3
		PCB, Total	96.1	Dermal	54.2				Dermal	0.4
		Total PAH	1.1	External Exposure	0.1					
		Uranium-238	0.2							
Outdoor Worker - subsurface	1.03E-03	Arsenic	2.6	Ingestion	41.2	8.11	Arsenic	2.1	Ingestion	99.0
		Chromium	0.2	Inhalation	4.5		Cobalt	2.3	Inhalation	0.5
		PCB, Total	96.0	Dermal	54.2		Uranium	93.1	Dermal	0.5
		Total PAH	1.0	External Exposure	0.1					
		Uranium-238	0.2							

Table D8.125. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 81 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.28E-05	PCB, Total	96.0	See Outdoor Worker (subsurface)		2.53	Uranium	93.1	See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.59E-03	Arsenic Chromium PCB, Total Total PAH Uranium-238	1.7 0.2 96.7 1.1 0.3	Ingestion Inhalation Dermal External Exposure	20.5 4.8 74.4 0.2	3.18	Arsenic Uranium	4.0 94.1	Ingestion Inhalation Dermal	96.7 0.8 2.5
Future Child Resident - surface	2.59E-03	Arsenic Chromium PCB, Total Total PAH Uranium-238	1.7 0.2 96.7 1.1 0.3	Ingestion Inhalation Dermal External Exposure	20.5 4.8 74.4 0.2	28.98	Aluminum Arsenic Mercury Uranium	0.5 2.2 1.2 96.0	Ingestion Inhalation Dermal	99.0 0.4 0.6
Future Teen Recreational User - surface	5.47E-04	Arsenic PCB, Total Total PAH	1.1 97.7 1.1	Ingestion Inhalation Dermal External Exposure	2.0 2.1 95.8 0.0	<1	Uranium	83.0	Ingestion Inhalation Dermal	84.0 2.1 13.8

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.126. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 153

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.18E-06	PCB, Total Total PAH	64.9 35.1	Ingestion Inhalation Dermal External Exposure	6.9 4.7 88.4	<1	*no COCs			
Outdoor Worker - surface	4.93E-06	PCB, Total Total PAH	63.7 36.3	Ingestion Inhalation Dermal External Exposure	41.6 2.9 55.5	<1	*no COCs			
Outdoor Worker - subsurface	3.07E-05	Arsenic Chromium PCB, Total Total PAH	77.8 5.3 12.0 4.9	Ingestion Inhalation Dermal External Exposure	67.1 5.9 27.0	<1	Arsenic	76.0	Ingestion Inhalation Dermal	77.4 5.4 17.2

Table D8.126. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 153 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.24E-05	PCB, Total Total PAH	64.1 35.9	Ingestion Inhalation Dermal External Exposure	20.8 3.1 76.1	<1	*no COCs			
Future Child Resident - surface	1.24E-05	PCB, Total Total PAH	64.1 35.9	Ingestion Inhalation Dermal External Exposure	20.8 3.1 76.1	<1	*no COCs			
Future Teen Recreational User - surface	2.67E-06	PCB, Total	63.8	Ingestion Inhalation Dermal External Exposure	2.0 1.3 96.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.127. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 156

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.91E-06	Chromium PCB, Total Total PAH Uranium-238	27.5 27.0 23.6 21.8	Ingestion Inhalation Dermal External Exposure	6.0 29.6 45.1 19.3	<1	*no COCs			
Outdoor Worker - surface	6.63E-06	Chromium PCB, Total Total PAH Uranium-238	18.1 27.9 25.7 28.2	Ingestion Inhalation Dermal External Exposure	37.9 19.6 29.8 12.7	<1	Manganese Mercury	43.3 42.5	Ingestion Inhalation Dermal	82.6 17.4
Outdoor Worker - subsurface	3.38E-05	Arsenic Chromium PCB, Total Total PAH Uranium-238	79.2 4.6 5.5 5.0 5.5	Ingestion Inhalation Dermal External Exposure	68.6 5.0 23.8 2.5	<1	Arsenic Cobalt Manganese Mercury	25.8 31.1 18.0 17.6	Ingestion Inhalation Dermal	86.5 7.7 5.8

Table D8.127. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 156 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.84E-05	Chromium PCB, Total Total PAH Uranium-238	17.1 25.5 23.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 18.4 37.1 31.2	<1	*no COCs			
Future Child Resident - surface	1.84E-05	Chromium PCB, Total Total PAH Uranium-238	17.1 25.5 23.0 34.3	Ingestion Inhalation Dermal External Exposure	13.4 18.4 37.1 31.2	1.09	Manganese Mercury	48.5 38.5	Ingestion Inhalation Dermal	74.8 25.2
Future Teen Recreational User - surface	2.48E-06	PCB, Total	40.5	Ingestion Inhalation Dermal External Exposure	2.2 12.9 75.2 9.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.128. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 160

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Outdoor Worker - surface	1.09E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	44.0 0.1 56.0	<1	*no COCs			
Outdoor Worker - subsurface	2.31E-05	Arsenic Chromium Total PAH	85.9 4.9 9.1	Ingestion Inhalation Dermal External Exposure	70.4 5.0 24.6	<1	Arsenic	89.9	Ingestion Inhalation Dermal	79.3 0.3 20.3

Table D8.128. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 160 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.72E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	*no COCs			
Future Child Resident - surface	2.72E-06	Total PAH	100.0	Ingestion Inhalation Dermal External Exposure	22.2 0.1 77.7	<1	*no COCs			
Future Teen Recreational User - surface	<1E-6	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.129. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 163

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	4.39E-06	Chromium Total PAH	37.3 62.7	Ingestion Inhalation Dermal External Exposure	4.7 37.4 57.9	<1	*no COCs			
Outdoor Worker - surface	4.57E-06	Chromium Total PAH	26.5 73.5	Ingestion Inhalation Dermal External Exposure	32.3 26.6 41.1	<1	*no COCs			
Outdoor Worker - subsurface	2.78E-05	Arsenic Chromium Total PAH	86.8 5.2 7.9	Ingestion Inhalation Dermal External Exposure	70.6 5.3 24.2	<1	Arsenic	53.5	Ingestion Inhalation Dermal	87.5 0.4 12.1

Table D8.129. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 163 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	1.16E-05	Chromium Total PAH	27.5 72.5	Ingestion Inhalation Dermal External Exposure	16.1 27.6 56.3	<1	*no COCs			
Future Child Resident - surface	1.16E-05	Chromium Total PAH	27.5 72.5	Ingestion Inhalation Dermal External Exposure	16.1 27.6 56.3	<1	*no COCs			
Future Teen Recreational User - surface	2.11E-06	Total PAH	85.9	Ingestion Inhalation Dermal External Exposure	1.8 14.2 84.0	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.130. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 219

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	<1E-6	*no COCs				<1	*no COCs			
Future Industrial Worker - surface	5.57E-06	Neptunium-237 Total PAH Uranium-238	21.9 22.8 46.5	Ingestion Inhalation Dermal External Exposure	7.4 0.3 21.0 71.3	<1	*no COCs			
Outdoor Worker - surface	6.74E-06	Neptunium-237 Total PAH Uranium-238	15.0 23.0 55.7	Ingestion Inhalation Dermal External Exposure	43.3 0.2 12.8 43.6	<1	*no COCs			
Outdoor Worker - subsurface	6.74E-06	Neptunium-237 Total PAH Uranium-238	15.0 23.0 55.7	Ingestion Inhalation Dermal External Exposure	43.3 0.2 12.8 43.6	<1	*no COCs			

Table D8.130. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 219 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	<1E-6			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.52E-05	Neptunium-237 Total PAH Uranium-235 Uranium-238	24.4 15.3 9.7 50.5	Ingestion Inhalation Dermal External Exposure	8.5 0.1 11.9 79.5	<1	*no COCs			
Future Child Resident - surface	2.52E-05	Neptunium-237 Total PAH Uranium-235 Uranium-238	24.4 15.3 9.7 50.5	Ingestion Inhalation Dermal External Exposure	8.5 0.1 11.9 79.5	<1	*no COCs			
Future Teen Recreational User - surface	1.71E-06	*no COCs				<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.

Table D8.131. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 488

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Current Industrial Worker - surface	3.82E-06	PCB, Total	80.5	Ingestion	6.2	<1	*no COCs			
				Inhalation	5.8					
				Dermal	75.2					
				External Exposure	12.9					
Future Industrial Worker - surface	6.82E-05	Cesium-137	8.9	Ingestion	6.2	<1	*no COCs			
		PCB, Total	80.5	Inhalation	5.8					
		Total PAH	6.2	Dermal	75.2					
		Uranium-238	3.9	External Exposure	12.9					
Outdoor Worker - surface	7.74E-05	Cesium-137	5.8	Ingestion	38.8	<1	*no COCs			
		PCB, Total	82.1	Inhalation	3.8					
		Total PAH	6.7	Dermal	49.0					
		Uranium-238	5.0	External Exposure	8.4					
Outdoor Worker - subsurface	1.00E-04	Arsenic	21.4	Ingestion	46.6	<1	Arsenic	88.5	Ingestion	79.6
		Cesium-137	4.5	Inhalation	4.2				Inhalation	0.3
		Chromium	1.3	Dermal	42.7				Dermal	20.0
		PCB, Total	63.5	External Exposure	6.5					
		Total PAH	5.1							
		Uranium-238	3.9							

Table D8.131. Summary of Risk Characterization Adjusted for Dermal Absorption for SWMU 488 (Continued)

Receptor	Total ELCR	COCs	%Total ELCR	Routes of Exposure	%Total ELCR	Total HI	COCs	%Total HI	Routes of Exposure	%Total HI
Excavation Worker - subsurface	1.25E-06			See Outdoor Worker (subsurface)		<1			See Outdoor Worker (subsurface) for %	
Future Adult Resident - surface	2.20E-04	Cesium-137 PCB, Total Total PAH Uranium-235 Uranium-238	13.9 73.5 5.8 0.9 6.0	Ingestion Inhalation Dermal External Exposure	16.6 3.5 59.8 20.1	<1	*no COCs			
Future Child Resident - surface	2.20E-04	Cesium-137 PCB, Total Total PAH Uranium-235 Uranium-238	13.9 73.5 5.8 0.9 6.0	Ingestion Inhalation Dermal External Exposure	16.6 3.5 59.8 20.1	<1	*no COCs			
Future Teen Recreational User - surface	3.91E-05	Cesium-137 PCB, Total Total PAH	3.2 88.1 7.1	Ingestion Inhalation Dermal External Exposure	1.9 1.8 91.5 4.7	<1	*no COCs			

Total ELCR and total HI represent total risk or hazard summed across all routes of exposure for all COPCs
*No COCs = There are no COCs. For Total HI <1, COCs listed are not applicable.
ELCR for Future Adult Resident and Future Child Resident are the combined lifetime scenario.
Outdoor Worker – subsurface and Excavation Worker – subsurface receptors include exposure to surface soils.