SWMU 2 SURFACE SAMPLES

U-234 SWMU 2 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-234 SWMU 2 Surface

General Statistics

Number of Valid Samples	10	Number of Unique Samples	10
Raw Statistics		Log-transformed Statistics	
Minimum	1.75	Minimum of Log Data	0.56
Maximum	51.9	Maximum of Log Data	3.949
Mean	16.72	Mean of log Data	2.458
Median	11.95	SD of log Data	0.958
SD	14.71		
Coefficient of Variation	0.88		
Skewness	1.67		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.848	Shapiro Wilk Test Statistic	0.98
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	25.25	95% H-UCL	48.42
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	41.44
95% Adjusted-CLT UCL	27	97.5% Chebyshev (MVUE) UCL	51.84
95% Modified-t UCL	25.66	99% Chebyshev (MVUE) UCL	72.28
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.144	Data appear Normal at 5% Significance Level	
Theta Star	14.61		
nu star	22.89		
Approximate Chi Square Value (.05)	13.01	Nonparametric Statistics	
Adjusted Level of Significance	0.0267	95% CLT UCL	24.37
Adjusted Chi Square Value	11.73	95% Jackknife UCL	25.25
		95% Standard Bootstrap UCL	24.2
Anderson-Darling Test Statistic	0.144	95% Bootstrap-t UCL	30.77
Anderson-Darling 5% Critical Value	0.739	95% Hall's Bootstrap UCL	58.39
Kolmogorov-Smirnov Test Statistic	0.134	95% Percentile Bootstrap UCL	23.78
Kolmogorov-Smirnov 5% Critical Value	0.271	95% BCA Bootstrap UCL	25.98
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	36.99
		97.5% Chebyshev(Mean, Sd) UCL	45.77
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	63
95% Approximate Gamma UCL	29.42		
95% Adjusted Gamma UCL	32.62		
Potential UCL to Use		Use 95% Student's-t UCL	25.25

U-238 SWMU 2 Surface

	General UCL Statistics for Full Data Sets			
User Selected Options				
From File	WorkSheet.wst			
Full Precision	OFF			
Confidence Coefficient	95%			
Number of Bootstrap Operations	2000			
U-238 SWMU Surface				
General Statistics				
Number of Valid Samples	10	Number of Unique Samples	10	
Raw Statistics		Log-transformed Statistics		
Minimum	2.2	Minimum of Log Data	0.788	
Maximum	365	Maximum of Log Data	5.9	
Mean	136.6	Mean of log Data	4.205	
Median	62.8	SD of log Data	1.539	
SD	139.6			
Coefficient of Variation	1.021			
Skewness	0.87			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.89	
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	217.5	95% H-UCL	1988	
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	578.5	
95% Adjusted-CLT UCL	222.2	97.5% Chebyshev (MVUE) UCL	751.5	
95% Modified-t UCL	219.6	99% Chebyshev (MVUE) UCL	1091	
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.647	Data appear Gamma Distributed at 5% Significance Level		
Theta Star	211.2			
nu star	12.94			
Approximate Chi Square Value (.05)	5.85	Nonparametric Statistics		
Adjusted Level of Significance	0.0267	95% CLT UCL	209.2	
Adjusted Chi Square Value	5.046	95% Jackknife UCL	217.5	
		95% Standard Bootstrap UCL	205.7	
Anderson-Darling Test Statistic	0.392	95% Bootstrap-t UCL	239	
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	193.3	
Kolmogorov-Smirnov Test Statistic	0.19	95% Percentile Bootstrap UCL	204	
Kolmogorov-Smirnov 5% Critical Value	0.275	95% BCA Bootstrap UCL	220.7	
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	329	
		97.5% Chebyshev(Mean, Sd) UCL	412.2	
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	575.8	
95% Approximate Gamma UCL	302.2			
95% Adjusted Gamma UCL	350.3			
Potential UCL to Use		Use 95% Approximate Gamma UCL	302.2	

SWMU 2 SUBSURFACE SAMPLES

Am-241 SWMU 2 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

AM-241 SWMU 2 Subsurface

General Statistics			
Number of Valid Samples	51	Number of Detected Data	47
Number of Unique Samples	19	Number of Non-Detect Data	4
		Percent Non-Detects	7.84%

Raw Statistics		Log-transformed Statistics
Minimum Detected	0.07	Log Statistics Not Available
Maximum Detected	4.65	
Mean of Detected	0.297	
Mean of Detected	0.297	
Mean of Detected	0.297	
Maximum Non-Detect	0.00113	

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	4
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	47
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	7.84%

UCL Statistics		
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only
Lilliefors Test Statistic	0.277	Not Available
5% Lilliefors Critical Value	0.946	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	0.273		
SD	0.642		
95% DL/2 (t) UCL	0.424		

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	0.238		
SD	0.67		
95% MLE (t) UCL	0.395		
95% MLE (Tiku) UCL	0.382		

Gamma Distribution Test with Detected Values Only	Data Distribution Test with Detected Values Only
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCLs to Use		Nonparametric Statistics	
99% KM (Chebyshev) UCL	**1.171**	Kaplan-Meier (KM) Method	
		Mean	0.279
		SD	0.634
		SE of Mean	0.0897
		95% KM (t) UCL	0.429
		95% KM (z) UCL	0.426
		95% KM (jackknife) UCL	0.428
		95% KM (bootstrap t) UCL	0.995

	95% KM (BCA) UCL	0.46
	95% KM (Percentile Bootstrap) UCL	0.454
	95% KM (Chebyshev) UCL	0.67
	97.5% KM (Chebyshev) UCL	0.839
	99% KM (Chebyshev) UCL	1.171

Note: DL/2 is not a recommended method.

Cs-137 SWMU 2 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Cs-137 SWMU 2 Subsurface

General Statistics

Number of Valid Samples	51	Number of Detected Data	15
Number of Unique Samples	11	Number of Non-Detect Data	36
		Percent Non-Detects	70.59%

Raw Statistics		Log-transformed Statistics
Minimum Detected	0.04	Log Statistics Not Available
Maximum Detected	51	
Mean of Detected	6.378	
Mean of Detected	6.378	
Mean of Detected	6.378	
Maximum Non-Detect	0.07	
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect 40
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected 11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage 78.43%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only
Lilliefors Test Statistic	0.429	Not Available
5% Lilliefors Critical Value	0.881	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	1.877		
SD	9.242		
95% DL/2 (t) UCL	4.046		

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	-21.01		
SD	24.18		
95% MLE (t) UCL	-15.33		
95% MLE (Tiku) UCL	-7.69		

Gamma Distribution Test with Detected Values Only	Data Distribution Test with Detected Values Only
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCLs to Use		Nonparametric Statistics	
95% KM (Chebyshev) UCL	**15.09**	Kaplan-Meier (KM) Method	
		Mean	1.904
		SD	9.145
		SE of Mean	1.326
		95% KM (t) UCL	4.126
		95% KM (z) UCL	4.084
		95% KM (jackknife) UCL	4.072
		95% KM (bootstrap t) UCL	307.5
		95% KM (BCA) UCL	4.434
		95% KM (Percentile Bootstrap) UCL	4.055
		95% KM (Chebyshev) UCL	7.682

	97.5% KM (Chebyshev) UCL	10.18
	99% KM (Chebyshev) UCL	15.09

Note: DL/2 is not a recommended method.

Pu-239 SWMU 2 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Pu-239 SWMU 2 Subsurface

General Statistics

Number of Valid Samples	52	Number of Detected Data	46
Number of Unique Samples	11	Number of Non-Detect Data	6
		Percent Non-Detects	11.54%

Raw Statistics		Log-transformed Statistics
Minimum Detected	-0.003	Log Statistics Not Available
Maximum Detected	16.1	
Mean of Detected	0.628	
Mean of Detected	0.628	
Mean of Detected	0.628	
Maximum Non-Detect	0.0504	
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect 45
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected 7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage 86.54%

UCL Statistics		
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only
Lilliefors Test Statistic	0.231	Not Available
5% Lilliefors Critical Value	0.945	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	0.556		
SD	2.738		
95% DL/2 (t) UCL	1.192		
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	-11.49		
SD	10.12		
95% MLE (t) UCL	-9.14		
95% MLE (Tiku) UCL	-3.537		

Gamma Distribution Test with Detected Values Only	Data Distribution Test with Detected Values Only
Gamma Statistics Not Available	Data do not follow a Discernable Distribution (0.05)

Potential UCLs to Use		Nonparametric Statistics	
99% KM (Chebyshev) UCL	**4.339**	Kaplan-Meier (KM) Method	
		Mean	0.555
		SD	2.712
		SE of Mean	0.38
		95% KM (t) UCL	1.192
		95% KM (z) UCL	1.181
		95% KM (jackknife) UCL	1.192
		95% KM (bootstrap t) UCL	78.59
		95% KM (BCA) UCL	1.32
		95% KM (Percentile Bootstrap) UCL	1.256
		95% KM (Chebyshev) UCL	2.213

	97.5% KM (Chebyshev) UCL	2.93
	99% KM (Chebyshev) UCL	4.339

Note: DL/2 is not a recommended method.

Th-230 SWMU 2 Subsurface

User Selected Options			
From File			
Full Precision			
Confidence Coefficient			
Number of Bootstrap Operations			
Th-230 SWMU 2 Surface			
General Statistics			
Number of Valid			
Samples	42	Number of Detected Data	40
Number of Unique Samples	36	Number of Non-Detect Data	2
		Percent Non-Detects	4.76%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.177	Minimum Detected	-1.732
Maximum Detected	15.9	Maximum Detected	2.766
Mean of Detected	1.353	Mean of Detected	-0.482
SD of Detected	2.974	SD of Detected	1.039
Minimum Non-Detect	0.147	Minimum Non-Detect	-1.917
Maximum Non-Detect	0.297	Maximum Non-Detect	-1.214
Note: Data have multiple DLs - Use of KM Method is			
recommended		Number treated as Non-Detect	12
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	30
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	28.57%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.38	Shapiro Wilk Test Statistic	0.851
5% Shapiro Wilk Critical Value	0.94	5% Shapiro Wilk Critical Value	0.94
Data not Normal at 5% Significance			
Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.294	Mean	-0.566
SD	2.913	SD	1.086
95% DL/2 (t) UCL	2.051	95% H-Stat (DL/2) UCL	1.325
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.533	Mean in Log Scale	-0.57
SD	3.556	SD in Log Scale	1.099
95% MLE (t) UCL	1.457	Mean in Original Scale	1.294
95% MLE (Tiku)			
UCL	1.484	SD in Original Scale	2.913
		95% Percentile Bootstrap UCL	2.143
		95% BCA Bootstrap UCL	2.505
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.721	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.876		
nu star	57.71		
A-D Test Statistic	3.903	Nonparametric Statistics	
5% A-D Critical Value	0.789	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.789	Mean	1.298
5% K-S Critical Value	0.145	SD	2.876
		SE of	
Data not Gamma Distributed at 5% Significance Level		Mean	0.45
		95% KM (t) UCL	2.055

Assuming Gamma Distribution		95% KM (z) UCL	2.038
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	2.054
Minimum	0	95% KM (bootstrap t) UCL	5.058
Maximum	15.9	95% KM (BCA) UCL	2.098
Mean	1.289	95% KM (Percentile Bootstrap) UCL	2.118
Median	0.381	95% KM (Chebyshev) UCL	3.258
SD	2.915	97.5% KM (Chebyshev) UCL	4.106
k star	0.377	99% KM (Chebyshev) UCL	5.771
Theta star	3.418		
Nu star	31.67	**Potential UCLs to Use**	
AppChi2	19.81	**95% KM (Chebyshev) UCL**	**3.258**
95% Gamma Approximate UCL	2.06		
95% Adjusted Gamma UCL	2.096		

U-234 SWMU 2 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

U-234 SWMU 2 Subsurface

General Statistics			
Number of Valid Samples	52	Number of Detected Data	49
Number of Unique Samples	26	Number of Non-Detect Data	3
		Percent Non-Detects	5.77%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.71	Minimum Detected	-0.342
Maximum Detected	155	Maximum Detected	5.043
Mean of Detected	10.52	Mean of Detected	0.695
SD of Detected	31.43	SD of Detected	1.438
Minimum Non-Detect	0.0314	Minimum Non-Detect	-3.461
Maximum Non-Detect	0.099	Maximum Non-Detect	-2.313
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	3
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	49
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	5.77%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.348	Lilliefors Test Statistic	0.701
5% Lilliefors Critical Value	0.947	5% Lilliefors Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.914	Mean	0.456
SD	30.59	SD	1.705
95% DL/2 (t) UCL	17.02	95% H-Stat (DL/2) UCL	9.234
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	8.637	Mean in Log Scale	0.525
SD	31.42	SD in Log Scale	1.558
95% MLE (t) UCL	15.94	Mean in Original Scale	9.918
95% MLE (Tiku) UCL	15.21	SD in Original Scale	30.59
		95% Percentile Bootstrap UCL	17.42
		95% BCA Bootstrap UCL	21.03
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.387	Data do not follow a Discernable Distribution (0.05)	
Theta Star	27.21		
nu star	37.88		
A-D Test Statistic	8.745	Nonparametric Statistics	
5% A-D Critical Value	0.839	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.839	Mean	9.953
5% K-S Critical Value	0.136	SD	30.28
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.243
		95% KM (t) UCL	17.06
Assuming Gamma Distribution		95% KM (z) UCL	16.93
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	17.06

Minimum	0	95% KM (bootstrap t) UCL	37.23
Maximum	155	95% KM (BCA) UCL	18.37
Mean	9.912	95% KM (Percentile Bootstrap) UCL	17.25
Median	0.985	95% KM (Chebyshev) UCL	28.45
SD	30.59	97.5% KM (Chebyshev) UCL	36.45
k star	0.249	99% KM (Chebyshev) UCL	52.17
Theta star	39.83		
Nu star	25.88	**Potential UCLs to Use**	
AppChi2	15.29	**95% KM (Chebyshev) UCL**	**28.45**
95% Gamma Approximate UCL	16.78		
95% Adjusted Gamma UCL	17.04		

Note: DL/2 is not a recommended method.

U-235 SWMU 2 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-235 SWMU 2 Subsurface

General Statistics			
Number of Valid Samples	46	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	0.03	Minimum of Log Data	-3.507
Maximum	25.8	Maximum of Log Data	3.25
Mean	1.616	Mean of log Data	-1.793
Median	0.1	SD of log Data	1.699
SD	5.38		
Coefficient of Variation	3.33		
Skewness	4.237		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.325	Shapiro Wilk Test Statistic	0.763
Shapiro Wilk Critical Value	0.945	Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	2.948	95% H-UCL	1.581
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.64
95% Adjusted-CLT UCL	3.45	97.5% Chebyshev (MVUE) UCL	2.066
95% Modified-t UCL	3.031	99% Chebyshev (MVUE) UCL	2.902
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.298	Data do not follow a Discernable Distribution (0.05)	
Theta Star	5.427		
nu star	27.39		
Approximate Chi Square Value (.05)	16.45	Nonparametric Statistics	
Adjusted Level of Significance	0.0448	95% CLT UCL	2.92
Adjusted Chi Square Value	16.18	95% Jackknife UCL	2.948
		95% Standard Bootstrap UCL	2.932
Anderson-Darling Test Statistic	8.174	95% Bootstrap-t UCL	7.413
Anderson-Darling 5% Critical Value	0.861	95% Hall's Bootstrap UCL	8.243
Kolmogorov-Smirnov Test Statistic	0.358	95% Percentile Bootstrap UCL	3.074
Kolmogorov-Smirnov 5% Critical Value	0.142	95% BCA Bootstrap UCL	3.617
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	5.073
		97.5% Chebyshev(Mean, Sd) UCL	6.57
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	9.509
95% Approximate Gamma UCL	2.69		
95% Adjusted Gamma UCL	2.735		
Potential UCL to Use		**Use 99% Chebyshev (Mean, Sd) UCL**	**9.509**

U-238 SWMU 2 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst

Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

U-238 SWMU 2 Subsurface

General Statistics			
Number of Valid Samples	52	Number of Detected Data	49
Number of Unique Samples	29	Number of Non-Detect Data	3
		Percent Non-Detects	5.77%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.71	Minimum Detected	-0.342
Maximum Detected	947	Maximum Detected	6.853
Mean of Detected	68.01	Mean of Detected	1.391
SD of Detected	200.5	SD of Detected	2.142
Minimum Non-Detect	0.025	Minimum Non-Detect	-3.689
Maximum Non-Detect	0.0922	Maximum Non-Detect	-2.384

Note: Data have multiple DLs - Use of KM Method is recommended			
		Number treated as Non-Detect	3
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	49
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	5.77%

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.387	Lilliefors Test Statistic	0.748
5% Lilliefors Critical Value	0.947	5% Lilliefors Critical Value	0.947
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	64.09	Mean	1.108
SD	195.2	SD	2.383
95% DL/2 (t) UCL	109.4	95% H-Stat (DL/2) UCL	115.9

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	55.94	Mean in Log Scale	1.128
SD	200.5	SD in Log Scale	2.339
95% MLE (t) UCL	102.5	Mean in Original Scale	64.09
95% MLE (Tiku) UCL	97.93	SD in Original Scale	195.2
		95% Percentile Bootstrap UCL	113.4
		95% BCA Bootstrap UCL	128.5

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.249	Data do not follow a Discernable Distribution (0.05)	
Theta Star	272.9		
nu star	24.42		
A-D Test Statistic	7.789	Nonparametric Statistics	
5% A-D Critical Value	0.884	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.884	Mean	64.13
5% K-S Critical Value	0.139	SD	193.3
Data not Gamma Distributed at 5% Significance Level		SE of Mean	27.08
		95% KM (t) UCL	109.5
Assuming Gamma Distribution		95% KM (z) UCL	108.7
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	109.5
Minimum	0	95% KM (bootstrap t) UCL	175
Maximum	947	95% KM (BCA) UCL	118.4
Mean	64.09	95% KM (Percentile Bootstrap) UCL	108.4
Median	1.08	95% KM (Chebyshev) UCL	182.2

SD	195.2	97.5% KM (Chebyshev) UCL	233.2
k star	0.186	99% KM (Chebyshev) UCL	333.5
Theta star	343.7		
Nu star	19.39	**Potential UCLs to Use**	
AppChi2	10.4	**99% KM (Chebyshev) UCL**	**333.5**
95% Gamma Approximate UCL	119.5		
95% Adjusted Gamma UCL	121.7		
Note: DL/2 is not a recommended method.			

SWMU 3 SUBSURFACE SAMPLES

Antimony SWMU 3 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony SWMU 3 Subsurface

General Statistics			
Number of Valid Samples	23	Number of Detected Data	11
Number of Unique Samples	10	Number of Non-Detect Data	12
		Percent Non-Detects	52.17%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	8.58	Minimum Detected	2.149
Maximum Detected	15.7	Maximum Detected	2.754
Mean of Detected	10.62	Mean of Detected	2.349
SD of Detected	1.953	SD of Detected	0.166
Minimum Non-Detect	7.31	Minimum Non-Detect	1.989
Maximum Non-Detect	9.96	Maximum Non-Detect	2.299
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	17
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	73.91%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.814	Shapiro Wilk Test Statistic	0.88
5% Shapiro Wilk Critical Value	0.85	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.429	Mean	1.906
SD	3.404	SD	0.454
95% DL/2 (t) UCL	8.648	95% H-Stat (DL/2) UCL	7.891
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	7.829	Mean in Log Scale	2.156
SD	3.197	SD in Log Scale	0.223
95% MLE (t) UCL	8.974	Mean in Original Scale	8.857
95% MLE (Tiku) UCL	10.07	SD in Original Scale	2.185
		95% Percentile Bootstrap UCL	9.636
		95% BCA Bootstrap UCL	9.734
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	27.31	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.389		
nu star	600.8		
A-D Test Statistic	0.589	Nonparametric Statistics	
5% A-D Critical Value	0.729	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.729	Mean	9.575
5% K-S Critical Value	0.255	SD	1.636
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.359
		95% KM (t) UCL	10.19
Assuming Gamma Distribution		95% KM (z) UCL	10.17
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	10.17

Minimum	8.58	95% KM (bootstrap t) UCL	10.54
Maximum	15.7	95% KM (BCA) UCL	10.61
Mean	10.58	95% KM (Percentile Bootstrap) UCL	10.45
Median	10.68	95% KM (Chebyshev) UCL	11.14
SD	1.335	97.5% KM (Chebyshev) UCL	11.82
k star	65.85	99% KM (Chebyshev) UCL	13.15
Theta star	0.161		
Nu star	3029	**Potential UCLs to Use**	
AppChi2	2902	**95% KM (t) UCL**	**10.19**
95% Gamma Approximate UCL	11.04		
95% Adjusted Gamma UCL	11.08		

Note: DL/2 is not a recommended method.

U-234 SWMU 3 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-234 SWMU 3 Subsurface

General Statistics

Number of Valid Samples	33	Number of Detected Data	13
Number of Unique Samples	13	Number of Non-Detect Data	20
		Percent Non-Detects	60.61%

Raw Statistics		Log-transformed Statistics
Minimum Detected	0.142	Log Statistics Not Available
Maximum Detected	3.02	
Mean of Detected	0.692	
Mean of Detected	0.692	
Mean of Detected	0.692	
Maximum Non-Detect	0.121	
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect 20
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected 13
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage 60.61%

UCL Statistics		
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only
Shapiro Wilk Test Statistic	0.692	Not Available
5% Shapiro Wilk Critical Value	0.866	
Data not Normal at 5% Significance Level		

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	0.287		
SD	0.583		
95% DL/2 (t) UCL	0.459		

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	-0.255		
SD	1.052		
95% MLE (t) UCL	0.0549		
95% MLE (Tiku) UCL	0.195		

Gamma Distribution Test with Detected Values Only	Data Distribution Test with Detected Values Only
Gamma Statistics Not Available	Data appear Gamma Distributed at 5% Significance Level

Potential UCLs to Use		Nonparametric Statistics	
95% KM (t) UCL	**0.525**	Kaplan-Meier (KM) Method	
		Mean	0.358
		SD	0.543
		SE of Mean	0.0985
		95% KM (t) UCL	0.525
		95% KM (z) UCL	0.52
		95% KM (jackknife) UCL	0.515
		95% KM (bootstrap t) UCL	0.703
		95% KM (BCA) UCL	0.547
		95% KM (Percentile Bootstrap) UCL	0.538

	95% KM (Chebyshev) UCL	0.788
	97.5% KM (Chebyshev) UCL	0.973
	99% KM (Chebyshev) UCL	1.338

Note: DL/2 is not a recommended method.

U-238 SWMU 3 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

U-238 SWMU 3 Subsurface

General Statistics			
Number of Valid Samples	33	Number of Detected Data	18
Number of Unique Samples	18	Number of Non-Detect Data	15
		Percent Non-Detects	45.45%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.127	Minimum Detected	-2.064
Maximum Detected	22.4	Maximum Detected	3.109
Mean of Detected	3.189	Mean of Detected	-0.054
SD of Detected	5.414	SD of Detected	1.658
Minimum Non-Detect	0.00316	Minimum Non-Detect	-5.757
Maximum Non-Detect	0.0982	Maximum Non-Detect	-2.321
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	15
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	18
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	45.45%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.607	Shapiro Wilk Test Statistic	0.893
5% Shapiro Wilk Critical Value	0.897	5% Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.75	Mean	-1.888
SD	4.258	SD	2.455
95% DL/2 (t) UCL	3.005	95% H-Stat (DL/2) UCL	3.139
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.963
		SD in Log Scale	2.443
		Mean in Original Scale	1.746
		SD in Original Scale	4.26
		95% Percentile Bootstrap UCL	3.058
		95% BCA Bootstrap UCL	3.719
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.471	Data do not follow a Discernable Distribution (0.05)	
Theta Star	6.777		
nu star	16.94		
A-D Test Statistic	1.041	Nonparametric Statistics	
5% A-D Critical Value	0.798	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.798	Mean	1.797
5% K-S Critical Value	0.215	SD	4.174
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.748
		95% KM (t) UCL	3.064
Assuming Gamma Distribution		95% KM (z) UCL	3.027

Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.041
Minimum	0.127	95% KM (bootstrap t) UCL	4.461
Maximum	22.4	95% KM (BCA) UCL	3.167
Mean	2.326	95% KM (Percentile Bootstrap) UCL	3.164
Median	1.291	95% KM (Chebyshev) UCL	5.056
SD	4.061	97.5% KM (Chebyshev) UCL	6.466
k star	0.734	99% KM (Chebyshev) UCL	9.236
Theta star	3.168		
Nu star	48.45	**Potential UCLs to Use**	
AppChi2	33.47	**99% KM (Chebyshev) UCL**	**9.236**
95% Gamma Approximate UCL	3.367		
95% Adjusted Gamma UCL	3.433		
Note: DL/2 is not a recommended method.			

SWMU 4 SURFACE SAMPLES

Beryllium SWMU 4

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Barium SWMU 4.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
General Statistics			
Number of Valid Samples	13	Number of Detected Data	11
Number of Unique Samples	11	Number of Non-Detect Data	2
		Percent Non-Detects	15.38%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.51	Minimum Detected	-0.673
Maximum Detected	1.11	Maximum Detected	0.104
Mean of Detected	0.69	Mean of Detected	-0.393
SD of Detected	0.163	SD of Detected	0.213
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only			
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.914
5% Shapiro Wilk Critical Value	0.85	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.622	Mean	-0.546
SD	0.222	SD	0.42
95% DL/2 (t) UCL	0.732	95% H-Stat (DL/2) UCL	0.648
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.645	Mean in Log Scale	-0.469
SD	0.181	SD in Log Scale	0.27
95% MLE (t) UCL	0.734	Mean in Original Scale	0.647
95% MLE (Tiku) UCL	0.734	SD in Original Scale	0.182
		95% Percentile Bootstrap UCL	0.732
		95% BCA Bootstrap UCL	0.752
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	16.78		
Theta Star	0.0411		
nu star	369.1		
A-D Test Statistic	0.459	Nonparametric Statistics	
5% A-D Critical Value	0.729	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.729	Mean	0.662
5% K-S Critical Value	0.255	SD	0.157
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0457
		95% KM (t) UCL	0.744
Assuming Gamma Distribution		95% KM (z) UCL	0.737
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.742
Minimum	0.431	95% KM (bootstrap t) UCL	0.785
Maximum	1.11	95% KM (BCA) UCL	0.752
Mean	0.656	95% KM (Percentile Bootstrap) UCL	0.746
Median	0.669	95% KM (Chebyshev) UCL	0.861
SD	0.171	97.5% KM (Chebyshev) UCL	0.947

k star	14.03	99% KM (Chebyshev) UCL	1.117
Theta star	0.0468		
Nu star	364.7	Potential UCLs to Use	
AppChi2	321.5	**95% KM (BCA) UCL**	**0.732**
95% Gamma Approximate UCL	0.745		
95% Adjusted Gamma UCL	0.758		
Note: DL/2 is not a recommended method.			

Chromium SWMU 4 Surface

Chromium SWMU 4 Surface	General UCL Statistics for Full Data Sets		
User Selected Options			
From File	C:\aaa\Beryllium SWMU 4.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Chromium SWMU 4 Surface			
General Statistics			
Number of Valid Samples	13	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	9.91	Minimum of Log Data	2.294
Maximum	296	Maximum of Log Data	5.69
Mean	39.13	Mean of log Data	2.997
Median	15.3	SD of log Data	0.911
SD	77.74		
Coefficient of Variation	1.987		
Skewness	3.517		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.4	Shapiro Wilk Test Statistic	0.693
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	77.56	95% H-UCL	61.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	63.39
95% Adjusted-CLT UCL	97.07	97.5% Chebyshev (MVUE) UCL	78.22
95% Modified-t UCL	81.06	99% Chebyshev (MVUE) UCL	107.4
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.725	Data do not follow a Discernable Distribution (0.05)	
Theta Star	53.95		
nu star	18.86		
Approximate Chi Square Value (.05)	10.01	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	74.59
Adjusted Chi Square Value	9.107	95% Jackknife UCL	77.56
		95% Standard Bootstrap UCL	73.44
Anderson-Darling Test Statistic	2.417	95% Bootstrap-t UCL	364.6
Anderson-Darling 5% Critical Value	0.764	95% Hall's Bootstrap UCL	292.1
Kolmogorov-Smirnov Test Statistic	0.381	95% Percentile Bootstrap UCL	80.63
Kolmogorov-Smirnov 5% Critical Value	0.244	95% BCA Bootstrap UCL	102
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	133.1
		97.5% Chebyshev(Mean, Sd) UCL	173.8
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	253.7
95% Approximate Gamma UCL	73.69		
95% Adjusted Gamma UCL	81.02		
Potential UCL to Use		**Use 95% Chebyshev (Mean, Sd) UCL**	**133.1**

Iron SWMU 4 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	C:\aaa\Chromium SWMU 4.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Iron SWMU 4 Surface

General Statistics			
Number of Valid Samples	13	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	4570	Minimum of Log Data	8.427
Maximum	41900	Maximum of Log Data	10.64
Mean	16459	Mean of log Data	9.57
Median	14500	SD of log Data	0.544
SD	9773		
Coefficient of Variation	0.594		
Skewness	1.77		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.809	Shapiro Wilk Test Statistic	0.943
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	21290	95% H-UCL	23370
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	27534
95% Adjusted-CLT UCL	22340	97.5% Chebyshev (MVUE) UCL	32346
95% Modified-t UCL	21512	99% Chebyshev (MVUE) UCL	41799
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.957	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	5567		
nu star	76.87		
Approximate Chi Square Value (.05)	57.68	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	20918
Adjusted Chi Square Value	55.31	95% Jackknife UCL	21290
		95% Standard Bootstrap UCL	20748
Anderson-Darling Test Statistic	0.562	95% Bootstrap-t UCL	26838
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	50264
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	21023
Kolmogorov-Smirnov 5% Critical Value	0.238	95% BCA Bootstrap UCL	22565
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28274
		97.5% Chebyshev(Mean, Sd) UCL	33386
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43428
95% Approximate Gamma UCL	21937		
95% Adjusted Gamma UCL	22875		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**21937**

Nickel SWMU 4 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Iron SWMU 4.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Nickel SWMU 4 Surface

General Statistics			
Number of Valid Samples	13	Number of Detected Data	11
Number of Unique Samples	11	Number of Non-Detect Data	2
		Percent Non-Detects	15.38%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	5.03	Minimum Detected	1.615
Maximum Detected	153	Maximum Detected	5.03
Mean of Detected	27.05	Mean of Detected	2.756
SD of Detected	42.44	SD of Detected	0.929
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.508	Shapiro Wilk Test Statistic	0.889
5% Shapiro Wilk Critical Value	0.85	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	23.27	Mean	2.473
SD	39.83	SD	1.094
95% DL/2 (t) UCL	42.96	95% H-Stat (DL/2) UCL	28.03
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	19.15	Mean in Log Scale	2.426
SD	42.57	SD in Log Scale	1.174
95% MLE (t) UCL	40.19	Mean in Original Scale	23.18
95% MLE (Tiku) UCL	39.24	SD in Original Scale	39.88
		95% Percentile Bootstrap UCL	43.35
		95% BCA Bootstrap UCL	55.73
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.831	Data appear Lognormal at 5% Significance Level	
Theta Star	32.56		
nu star	18.28		
A-D Test Statistic	1.072	Nonparametric Statistics	
5% A-D Critical Value	0.75	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.75	Mean	23.66
5% K-S Critical Value	0.262	SD	38.07
Data not Gamma Distributed at 5% Significance Level		SE of Mean	11.07
		95% KM (t) UCL	43.4
Assuming Gamma Distribution		95% KM (z) UCL	41.88
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	43.05
Minimum	0	95% KM (bootstrap t) UCL	100
Maximum	153	95% KM (BCA) UCL	46.36
Mean	22.89	95% KM (Percentile Bootstrap) UCL	44.34
Median	10.9	95% KM (Chebyshev) UCL	71.93
SD	40.06	97.5% KM (Chebyshev) UCL	92.81
k star	0.195	99% KM (Chebyshev) UCL	133.8

Theta star	117.5		
Nu star	5.065	Potential UCLs to Use	
AppChi2	1.182	**95% KM (Chebyshev) UCL**	**71.93**
95% Gamma Approximate UCL	98.05		
95% Adjusted Gamma UCL	123.3		
Note: DL/2 is not a recommended method.			

Vanadium SWMU 4 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Vanadium SWMU 4 Surface

General Statistics			
Number of Valid Samples	13	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	6.65	Minimum of Log Data	1.895
Maximum	47.8	Maximum of Log Data	3.867
Mean	25.01	Mean of log Data	3.139
Median	23.4	SD of log Data	0.455
SD	9.54		
Coefficient of Variation	0.381		
Skewness	0.656		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.918	Shapiro Wilk Test Statistic	0.844
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	29.73	95% H-UCL	33.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.64
95% Adjusted-CLT UCL	29.88	97.5% Chebyshev (MVUE) UCL	45.82
95% Modified-t UCL	29.81	99% Chebyshev (MVUE) UCL	57.95
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.952	Data appear Normal at 5% Significance Level	
Theta Star	5.051		
nu star	128.7		
Approximate Chi Square Value (.05)	103.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0301	95% CLT UCL	29.36
Adjusted Chi Square Value	100.3	95% Jackknife UCL	29.73
		95% Standard Bootstrap UCL	29.13
Anderson-Darling Test Statistic	0.645	95% Bootstrap-t UCL	30.57
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	32.86
Kolmogorov-Smirnov Test Statistic	0.214	95% Percentile Bootstrap UCL	29.18
Kolmogorov-Smirnov 5% Critical Value	0.237	95% BCA Bootstrap UCL	29.77
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	36.54
		97.5% Chebyshev(Mean, Sd) UCL	41.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	51.34
95% Approximate Gamma UCL	31.1		
95% Adjusted Gamma UCL	32.1		
Potential UCL to Use		**Use 95% Student's-t UCL**	**29.73**

SWMU 4 SUBSURFACE SAMPLES

Aluminum SWMU 4 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum SWMU 4 Subsurface

General Statistics			
Number of Valid Samples	39	Number of Unique Samples	34
Raw Statistics		**Log-transformed Statistics**	
Minimum	3320	Minimum of Log Data	8.108
Maximum	19000	Maximum of Log Data	9.852
Mean	10645	Mean of log Data	9.234
Median	10100	SD of log Data	0.297
SD	2906		
Coefficient of Variation	0.273		
Skewness	0.529		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
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	11430	95% H-UCL	11656
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12941
95% Adjusted-CLT UCL	11453	97.5% Chebyshev (MVUE) UCL	13918
95% Modified-t UCL	11436	99% Chebyshev (MVUE) UCL	15836
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.89	Data appear Normal at 5% Significance Level	
Theta Star	895.4		
nu star	927.3		
Approximate Chi Square Value (.05)	857.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0437	95% CLT UCL	11411
Adjusted Chi Square Value	855	95% Jackknife UCL	11430
		95% Standard Bootstrap UCL	11399
Anderson-Darling Test Statistic	0.666	95% Bootstrap-t UCL	11502
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	11543
Kolmogorov-Smirnov Test Statistic	0.118	95% Percentile Bootstrap UCL	11411
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	11446
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12674
		97.5% Chebyshev(Mean, Sd) UCL	13551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15275
95% Approximate Gamma UCL	11510		
95% Adjusted Gamma UCL	11546		
Potential UCL to Use		**Use 95% Student's-t UCL**	**11430**

Arsenic SWMU 4 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic SWMU 4 Subsurface

General Statistics

Number of Valid Samples	39	Number of Detected Data	10
Number of Unique Samples	10	Number of Non-Detect Data	29
		Percent Non-Detects	74.36%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	5.97	Minimum Detected	1.787
Maximum Detected	17.1	Maximum Detected	2.839
Mean of Detected	10.09	Mean of Detected	2.266
SD of Detected	3.346	SD of Detected	0.314
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.922	Shapiro Wilk Test Statistic	0.977
5% Shapiro Wilk Critical Value	0.842	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.447	Mean	1.262
SD	3.733	SD	0.616
95% DL/2 (t) UCL	5.455	95% H-Stat (DL/2) UCL	4.235
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.0384	Mean in Log Scale	1.341
SD	7.829	SD in Log Scale	0.723
95% MLE (t) UCL	2.152	Mean in Original Scale	4.91
95% MLE (Tiku) UCL	4.161	SD in Original Scale	3.698
		95% Percentile Bootstrap UCL	5.845
		95% BCA Bootstrap UCL	6.072
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	7.837	Data appear Normal at 5% Significance Level	
Theta Star	1.288		
nu star	156.7		
A-D Test Statistic	0.243	Nonparametric Statistics	
5% A-D Critical Value	0.725	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.725	Mean	7.027
5% K-S Critical Value	0.267	SD	2.414
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.407
		95% KM (t) UCL	7.714
Assuming Gamma Distribution		95% KM (z) UCL	7.697
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	7.738
Minimum	4.465	95% KM (bootstrap t) UCL	7.786
Maximum	19.7	95% KM (BCA) UCL	9.423
Mean	13.54	95% KM (Percentile Bootstrap) UCL	8.915
Median	14.01	95% KM (Chebyshev) UCL	8.803
SD	4.354	97.5% KM (Chebyshev) UCL	9.571
k star	7.69	99% KM (Chebyshev) UCL	11.08

Theta star	1.761		
Nu star	599.8	Potential UCLs to Use	
AppChi2	544	95% KM (t) UCL	7.714
95% Gamma Approximate UCL	14.93	**95% KM (Percentile Bootstrap) UCL**	**8.915**
95% Adjusted Gamma UCL	14.99		
Note: DL/2 is not a recommended method.			

Barium SWMU 4 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Barium SWMU 4 Subsurface

General Statistics

Number of Valid Samples	39	Number of Unique Samples	36
Raw Statistics		Log-transformed Statistics	
Minimum	12.1	Minimum of Log Data	2.493
Maximum	313	Maximum of Log Data	5.746
Mean	105.6	Mean of log Data	4.546
Median	104	SD of log Data	0.522
SD	51.13		
Coefficient of Variation	0.484		
Skewness	1.861		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.87	Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	119.4	95% H-UCL	127.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	148.8
95% Adjusted-CLT UCL	121.7	97.5% Chebyshev (MVUE) UCL	166.6
95% Modified-t UCL	119.8	99% Chebyshev (MVUE) UCL	201.7
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.22	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	25.02		
nu star	329.2		
Approximate Chi Square Value (.05)	288.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0437	95% CLT UCL	119.1
Adjusted Chi Square Value	286.6	95% Jackknife UCL	119.4
		95% Standard Bootstrap UCL	118.9
Anderson-Darling Test Statistic	0.684	95% Bootstrap-t UCL	123.5
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	129
Kolmogorov-Smirnov Test Statistic	0.108	95% Percentile Bootstrap UCL	119.4
Kolmogorov-Smirnov 5% Critical Value	0.142	95% BCA Bootstrap UCL	122.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	141.3
		97.5% Chebyshev(Mean, Sd) UCL	156.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	187.1
95% Approximate Gamma UCL	120.6		
95% Adjusted Gamma UCL	121.3		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**120.6**

Beryllium SWMU 4 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Beryllium SWMU 4 Subsurface

General Statistics			
Number of Valid Samples	39	Number of Detected Data	31
Number of Unique Samples	24	Number of Non-Detect Data	8
		Percent Non-Detects	20.51%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.51	Minimum Detected	-0.673
Maximum Detected	1.11	Maximum Detected	0.104
Mean of Detected	0.691	Mean of Detected	-0.386
SD of Detected	0.132	SD of Detected	0.182
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.927	Shapiro Wilk Test Statistic	0.962
5% Shapiro Wilk Critical Value	0.929	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.6	Mean	-0.591
SD	0.215	SD	0.44
95% DL/2 (t) UCL	0.659	95% H-Stat (DL/2) UCL	0.597
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.632	Mean in Log Scale	-0.473
SD	0.168	SD in Log Scale	0.241
95% MLE (t) UCL	0.677	Mean in Original Scale	0.641
95% MLE (Tiku) UCL	0.679	SD in Original Scale	0.155
		95% Percentile Bootstrap UCL	0.681
		95% BCA Bootstrap UCL	0.684
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	27.5	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0251		
nu star	1705		
A-D Test Statistic	0.37	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.745	Mean	0.654
5% K-S Critical Value	0.157	SD	0.137
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0223
		95% KM (t) UCL	0.691
Assuming Gamma Distribution		95% KM (z) UCL	0.69
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.69
Minimum	0.392	95% KM (bootstrap t) UCL	0.696
Maximum	1.11	95% KM (BCA) UCL	0.696
Mean	0.658	95% KM (Percentile Bootstrap) UCL	0.694
Median	0.62	95% KM (Chebyshev) UCL	0.751
SD	0.138	97.5% KM (Chebyshev) UCL	0.793
k star	22.63	99% KM (Chebyshev) UCL	0.876

Theta star	0.0291		
Nu star	1765	Potential UCLs to Use	
AppChi2	1669	**95% KM (Percentile Bootstrap) UCL**	**0.694**
95% Gamma Approximate UCL	0.696		
95% Adjusted Gamma UCL	0.698		
Note: DL/2 is not a recommended method.			

Iron SWMU 4 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Iron SWMU 4 Subsurface

General Statistics

Number of Valid Samples	39	Number of Unique Samples	37
Raw Statistics		Log-transformed Statistics	
Minimum	4570	Minimum of Log Data	8.427
Maximum	41900	Maximum of Log Data	10.64
Mean	15154	Mean of log Data	9.518
Median	13400	SD of log Data	0.469
SD	7543		
Coefficient of Variation	0.498		
Skewness	1.506		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.892	Shapiro Wilk Test Statistic	0.993
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
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	17190	95% H-UCL	17528
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20304
95% Adjusted-CLT UCL	17452	97.5% Chebyshev (MVUE) UCL	22539
95% Modified-t UCL	17239	99% Chebyshev (MVUE) UCL	26929
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.446	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	3408		
nu star	346.8		
Approximate Chi Square Value (.05)	304.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0437	95% CLT UCL	17140
Adjusted Chi Square Value	303.1	95% Jackknife UCL	17190
		95% Standard Bootstrap UCL	17094
Anderson-Darling Test Statistic	0.267	95% Bootstrap-t UCL	17523
Anderson-Darling 5% Critical Value	0.751	95% Hall's Bootstrap UCL	17702
Kolmogorov-Smirnov Test Statistic	0.107	95% Percentile Bootstrap UCL	17114
Kolmogorov-Smirnov 5% Critical Value	0.142	95% BCA Bootstrap UCL	17333
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20419
		97.5% Chebyshev(Mean, Sd) UCL	22697
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	27172
95% Approximate Gamma UCL	17250		
95% Adjusted Gamma UCL	17339		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**17250**

Manganese SWMU 4 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Manganese SWMU 4 Subsurface			
General Statistics			
Number of Valid Samples	40	Number of Unique Samples	39
Raw Statistics		Log-transformed Statistics	
Minimum	0.45	Minimum of Log Data	-0.799
Maximum	1520	Maximum of Log Data	7.326
Mean	375.6	Mean of log Data	5.352
Median	265.5	SD of log Data	1.415
SD	372.3		
Coefficient of Variation	0.991		
Skewness	1.663		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical Value	0.94	Shapiro Wilk Critical Value	0.94
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	474.8	95% H-UCL	1102
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1231
95% Adjusted-CLT UCL	489	97.5% Chebyshev (MVUE) UCL	1527
95% Modified-t UCL	477.4	99% Chebyshev (MVUE) UCL	2108
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.943	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	398.3		
nu star	75.44		
Approximate Chi Square Value (.05)	56.43	Nonparametric Statistics	
Adjusted Level of Significance	0.044	95% CLT UCL	472.4
Adjusted Chi Square Value	55.82	95% Jackknife UCL	474.8
		95% Standard Bootstrap UCL	473.7
Anderson-Darling Test Statistic	0.42	95% Bootstrap-t UCL	505.6
Anderson-Darling 5% Critical Value	0.779	95% Hall's Bootstrap UCL	491.8
Kolmogorov-Smirnov Test Statistic	0.121	95% Percentile Bootstrap UCL	474.1
Kolmogorov-Smirnov 5% Critical Value	0.144	95% BCA Bootstrap UCL	488.6
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	632.2
		97.5% Chebyshev(Mean, Sd) UCL	743.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	961.4
95% Approximate Gamma UCL	502.1		
95% Adjusted Gamma UCL	507.6		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**502.1**

Vanadium SWMU 4 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Vanadium SWMU 4 Subsurface

General Statistics			
Number of Valid Samples	39	Number of Unique Samples	38
Raw Statistics		Log-transformed Statistics	
Minimum	6.65	Minimum of Log Data	1.895
Maximum	47.8	Maximum of Log Data	3.867
Mean	23.07	Mean of log Data	3.082
Median	23.4	SD of log Data	0.358
SD	7.583		
Coefficient of Variation	0.329		
Skewness	0.61		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.97	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
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	25.12	95% H-UCL	25.81
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	29.12
95% Adjusted-CLT UCL	25.2	97.5% Chebyshev (MVUE) UCL	31.69
95% Modified-t UCL	25.14	99% Chebyshev (MVUE) UCL	36.73
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.252	Data appear Normal at 5% Significance Level	
Theta Star	2.796		
nu star	643.6		
Approximate Chi Square Value (.05)	585.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0437	95% CLT UCL	25.07
Adjusted Chi Square Value	583.6	95% Jackknife UCL	25.12
		95% Standard Bootstrap UCL	25.05
Anderson-Darling Test Statistic	0.349	95% Bootstrap-t UCL	25.15
Anderson-Darling 5% Critical Value	0.749	95% Hall's Bootstrap UCL	25.27
Kolmogorov-Smirnov Test Statistic	0.0994	95% Percentile Bootstrap UCL	25.06
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	25.17
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	28.37
		97.5% Chebyshev(Mean, Sd) UCL	30.66
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	35.15
95% Approximate Gamma UCL	25.35		
95% Adjusted Gamma UCL	25.45		
Potential UCL to Use		**Use 95% Student's-t UCL**	**25.12**

Aluminum SWMU 4 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum SWMU 4 Subsurface

General Statistics			
Number of Valid Samples	39	Number of Unique Samples	34
Raw Statistics		Log-transformed Statistics	
Minimum	3320	Minimum of Log Data	8.108
Maximum	19000	Maximum of Log Data	9.852
Mean	10645	Mean of log Data	9.234
Median	10100	SD of log Data	0.297
SD	2906		
Coefficient of Variation	0.273		
Skewness	0.529		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.958	Shapiro Wilk Test Statistic	0.917
Shapiro Wilk Critical Value	0.939	Shapiro Wilk Critical Value	0.939
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	11430	95% H-UCL	11656
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	12941
95% Adjusted-CLT UCL	11453	97.5% Chebyshev (MVUE) UCL	13918
95% Modified-t UCL	11436	99% Chebyshev (MVUE) UCL	15836
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	11.89	Data appear Normal at 5% Significance Level	
Theta Star	895.4		
nu star	927.3		
Approximate Chi Square Value (.05)	857.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0437	95% CLT UCL	11411
Adjusted Chi Square Value	855	95% Jackknife UCL	11430
		95% Standard Bootstrap UCL	11399
Anderson-Darling Test Statistic	0.666	95% Bootstrap-t UCL	11502
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	11543
Kolmogorov-Smirnov Test Statistic	0.118	95% Percentile Bootstrap UCL	11411
Kolmogorov-Smirnov 5% Critical Value	0.141	95% BCA Bootstrap UCL	11446
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	12674
		97.5% Chebyshev(Mean, Sd) UCL	13551
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15275
95% Approximate Gamma UCL	11510		
95% Adjusted Gamma UCL	11546		
Potential UCL to Use		**Use 95% Student's-t UCL**	**11430**

SWMU 5 SURFACE SAMPLES

Aluminum SWMU 5 Surface

	General UCL Statistics for Full Data Sets		
User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Aluminum SWMU 5 Surface			
General Statistics			
Number of Valid Samples	25	Number of Unique Samples	23
Raw Statistics		Log-transformed Statistics	
Minimum	2430	Minimum of Log Data	7.796
Maximum	13800	Maximum of Log Data	9.532
Mean	7818	Mean of log Data	8.881
Median	8080	SD of log Data	0.437
SD	3041		
Coefficient of Variation	0.389		
Skewness	0.252		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.964	Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
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	8859	95% H-UCL	9388
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10980
95% Adjusted-CLT UCL	8852	97.5% Chebyshev (MVUE) UCL	12321
95% Modified-t UCL	8864	99% Chebyshev (MVUE) UCL	14954
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.464	Data appear Normal at 5% Significance Level	
Theta Star	1431		
nu star	273.2		
Approximate Chi Square Value (.05)	235.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0395	95% CLT UCL	8819
Adjusted Chi Square Value	233.6	95% Jackknife UCL	8859
		95% Standard Bootstrap UCL	8808
Anderson-Darling Test Statistic	0.392	95% Bootstrap-t UCL	8900
Anderson-Darling 5% Critical Value	0.746	95% Hall's Bootstrap UCL	8897
Kolmogorov-Smirnov Test Statistic	0.131	95% Percentile Bootstrap UCL	8790
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	8762
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10469
		97.5% Chebyshev(Mean, Sd) UCL	11617
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13870
95% Approximate Gamma UCL	9054		
95% Adjusted Gamma UCL	9145		
Potential UCL to Use		**Use 95% Student's-t UCL**	**8859**

Arsenic SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	C:\aaa\Aluminum.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Arsenic SWMU 5 Surface

General Statistics

Number of Valid Samples	25	Number of Detected Data	7
Number of Unique Samples	7	Number of Non-Detect Data	18
		Percent Non-Detects	72.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	5.21	Minimum Detected	1.651
Maximum Detected	12.2	Maximum Detected	2.501
Mean of Detected	8.227	Mean of Detected	2.069
SD of Detected	2.442	SD of Detected	0.304
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.953	Shapiro Wilk Test Statistic	0.953
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	4.104	Mean	1.239
SD	2.895	SD	0.549
95% DL/2 (t) UCL	5.094	95% H-Stat (DL/2) UCL	4.159
Maximum Likelihood Estimate(MLE) Method		**Log ROS Method**	
Mean	2.173	Mean in Log Scale	1.226
SD	4.965	SD in Log Scale	0.685
95% MLE (t) UCL	3.872	Mean in Original Scale	4.252
95% MLE (Tiku) UCL	5.274	SD in Original Scale	2.972
		95% Percentile Bootstrap UCL	5.309
		95% BCA Bootstrap UCL	5.435
Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	7.557	Data appear Normal at 5% Significance Level	
Theta Star	1.089		
nu star	105.8		
A-D Test Statistic	0.256	**Nonparametric Statistics**	
5% A-D Critical Value	0.708	**Kaplan-Meier (KM) Method**	
K-S Test Statistic	0.708	Mean	6.055
5% K-S Critical Value	0.312	SD	1.807
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.39
		95% KM (t) UCL	6.723
Assuming Gamma Distribution		95% KM (z) UCL	6.697
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	6.616
Minimum	4.336	95% KM (bootstrap t) UCL	6.837
Maximum	15.44	95% KM (BCA) UCL	8.943
Mean	10.6	95% KM (Percentile Bootstrap) UCL	7.683
Median	10.87	95% KM (Chebyshev) UCL	7.757
SD	3.313	97.5% KM (Chebyshev) UCL	8.493
k star	8.088	99% KM (Chebyshev) UCL	9.94

Theta star	1.31		
Nu star	404.4	Potential UCLs to Use	
AppChi2	358.8	95% KM (t) UCL	6.723
95% Gamma Approximate UCL	11.94	**95% KM (Percentile Bootstrap) UCL**	**7.683**
95% Adjusted Gamma UCL	12.04		
Note: DL/2 is not a recommended method.			

Be SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Be SWMU 5 Surface

General Statistics

Number of Valid Samples	25	Number of Detected Data	10
Number of Unique Samples	9	Number of Non-Detect Data	15
		Percent Non-Detects	60.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.52	Minimum Detected	-0.654
Maximum Detected	0.79	Maximum Detected	-0.236
Mean of Detected	0.639	Mean of Detected	-0.457
SD of Detected	0.0904	SD of Detected	0.139
Minimum Non-Detect	0.5	Minimum Non-Detect	-0.693
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.907	Shapiro Wilk Test Statistic	0.921
5% Shapiro Wilk Critical Value	0.842	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.406	Mean	-1.014
SD	0.202	SD	0.472
95% DL/2 (t) UCL	0.475	95% H-Stat (DL/2) UCL	0.422
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.461	Mean in Log Scale	-0.724
SD	0.179	SD in Log Scale	0.27
95% MLE (t) UCL	0.522	Mean in Original Scale	0.502
95% MLE (Tiku) UCL	0.547	SD in Original Scale	0.136
		95% Percentile Bootstrap UCL	0.546
		95% BCA Bootstrap UCL	0.551
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	40.06	Data appear Normal at 5% Significance Level	
Theta Star	0.0159		
nu star	801.3		
A-D Test Statistic	0.501	Nonparametric Statistics	
5% A-D Critical Value	0.724	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.724	Mean	0.568
5% K-S Critical Value	0.266	SD	0.0796
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0168
		95% KM (t) UCL	0.596
Assuming Gamma Distribution		95% KM (z) UCL	0.595
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.596
Minimum	0.48	95% KM (bootstrap t) UCL	0.6
Maximum	0.79	95% KM (BCA) UCL	0.626
Mean	0.664	95% KM (Percentile Bootstrap) UCL	0.618
Median	0.67	95% KM (Chebyshev) UCL	0.641
SD	0.0908	97.5% KM (Chebyshev) UCL	0.672
k star	47.12	99% KM (Chebyshev) UCL	0.735

Theta star	0.0141		
Nu star	2356	Potential UCLs to Use	
AppChi2	2244	95% KM (t) UCL	0.596
95% Gamma Approximate UCL	0.697	**95% KM (Percentile Bootstrap) UCL**	**0.619**
95% Adjusted Gamma UCL	0.7		
Note: DL/2 is not a recommended method.			

Chromium SWMU 5 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	C:\aaa\Beryllium.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Chromium SWMU 5 Surface

General Statistics			
Number of Valid Samples	25	Number of Unique Samples	25
Raw Statistics		Log-transformed Statistics	
Minimum	5.37	Minimum of Log Data	1.681
Maximum	20.5	Maximum of Log Data	3.02
Mean	11.3	Mean of log Data	2.365
Median	11.3	SD of log Data	0.357
SD	3.934		
Coefficient of Variation	0.348		
Skewness	0.441		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.956	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.918	Shapiro Wilk Critical Value	0.918
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	12.64	95% H-UCL	12.98
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14.91
95% Adjusted-CLT UCL	12.66	97.5% Chebyshev (MVUE) UCL	16.47
95% Modified-t UCL	12.65	99% Chebyshev (MVUE) UCL	19.53
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	7.525	Data appear Normal at 5% Significance Level	
Theta Star	1.501		
nu star	376.2		
Approximate Chi Square Value (.05)	332.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0395	95% CLT UCL	12.59
Adjusted Chi Square Value	329.5	95% Jackknife UCL	12.64
		95% Standard Bootstrap UCL	12.55
Anderson-Darling Test Statistic	0.32	95% Bootstrap-t UCL	12.71
Anderson-Darling 5% Critical Value	0.745	95% Hall's Bootstrap UCL	12.66
Kolmogorov-Smirnov Test Statistic	0.113	95% Percentile Bootstrap UCL	12.54
Kolmogorov-Smirnov 5% Critical Value	0.175	95% BCA Bootstrap UCL	12.59
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.72
		97.5% Chebyshev(Mean, Sd) UCL	16.21
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.12
95% Approximate Gamma UCL	12.79		
95% Adjusted Gamma UCL	12.9		
Potential UCL to Use		**Use 95% Student's-t UCL**	**12.64**

Nickel SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	C:\aaa\Chromium.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nickel SWMU 5 Surface

General Statistics

Number of Valid Samples	25	Number of Detected Data	24
Number of Unique Samples	22	Number of Non-Detect Data	1
		Percent Non-Detects	4.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	6.9	Minimum Detected	1.932
Maximum Detected	119	Maximum Detected	4.779
Mean of Detected	15.19	Mean of Detected	2.442
SD of Detected	22.25	SD of Detected	0.551
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.305	Shapiro Wilk Test Statistic	0.62
5% Shapiro Wilk Critical Value	0.916	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	14.68	Mean	2.381
SD	21.93	SD	0.62
95% DL/2 (t) UCL	22.18	95% H-Stat (DL/2) UCL	14.26
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	14.2	Mean in Log Scale	2.399
SD	22.01	SD in Log Scale	0.58
95% MLE (t) UCL	21.73	Mean in Original Scale	14.74
95% MLE (Tiku) UCL	20.99	SD in Original Scale	21.9
		95% Percentile Bootstrap UCL	23.27
		95% BCA Bootstrap UCL	28.7
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.73	Data do not follow a Discernable Distribution (0.05)	
Theta Star	8.778		
nu star	83.05		
A-D Test Statistic	4.238	Nonparametric Statistics	
5% A-D Critical Value	0.756	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.756	Mean	14.86
5% K-S Critical Value	0.18	SD	21.4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.373
		95% KM (t) UCL	22.34
Assuming Gamma Distribution		95% KM (z) UCL	22.05
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	22.32
Minimum	0	95% KM (bootstrap t) UCL	60.21
Maximum	119	95% KM (BCA) UCL	23.91
Mean	14.58	95% KM (Percentile Bootstrap) UCL	23.33
Median	10.4	95% KM (Chebyshev) UCL	33.92
SD	21.99	97.5% KM (Chebyshev) UCL	42.16
k star	0.501	99% KM (Chebyshev) UCL	58.36

Theta star	29.09		
Nu star	25.06	Potential UCLs to Use	
AppChi2	14.66	**95% KM (Chebyshev) UCL**	**33.92**
95% Gamma Approximate UCL	24.93		
95% Adjusted Gamma UCL	25.88		
Note: DL/2 is not a recommended method.			

Benz(a)anthracene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Acenaphthene.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Benz(a)anthracene SWMU 5 Surface

General Statistics			
Number of Valid Samples	61	Number of Detected Data	31
Number of Unique Samples	29	Number of Non-Detect Data	30
		Percent Non-Detects	49.18%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.125	Minimum Detected	-2.079
Maximum Detected	130	Maximum Detected	4.868
Mean of Detected	13.64	Mean of Detected	1.169
SD of Detected	29.85	SD of Detected	1.66
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	32
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	29
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	52.46%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.482	Lilliefors Test Statistic	0.951
5% Lilliefors Critical Value	0.929	5% Lilliefors Critical Value	0.929
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7.051	Mean	-0.107
SD	22.16	SD	1.757
95% DL/2 (t) UCL	11.79	95% H-Stat (DL/2) UCL	3.751
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.599
		SD in Log Scale	2.3
		Mean in Original Scale	7.005
		SD in Original Scale	22.17
		95% Percentile Bootstrap UCL	12.08
		95% BCA Bootstrap UCL	14.31
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.426	Data appear Lognormal at 5% Significance Level	
Theta Star	32.05		
nu star	26.39		
A-D Test Statistic	2.163	Nonparametric Statistics	
5% A-D Critical Value	0.821	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.821	Mean	7.041
5% K-S Critical Value	0.168	SD	21.98
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.861
		95% KM (t) UCL	11.82
Assuming Gamma Distribution		95% KM (z) UCL	11.75
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	11.78
Minimum	0.125	95% KM (bootstrap t) UCL	20.99
Maximum	130	95% KM (BCA) UCL	13.31
Mean	13.89	95% KM (Percentile Bootstrap) UCL	11.9

Median	8.891	95% KM (Chebyshev) UCL	19.51
SD	21.6	97.5% KM (Chebyshev) UCL	24.91
k star	0.735	99% KM (Chebyshev) UCL	35.51
Theta star	18.9		
Nu star	89.63	Potential UCLs to Use	
AppChi2	68.8	**97.5% KM (Chebyshev) UCL**	**24.91**
95% Gamma Approximate UCL	18.09		
95% Adjusted Gamma UCL	18.21		
Note: DL/2 is not a recommended method.			

Benzo(a)pyrene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Benz(a)anthracene.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Benzo(a)pyrene SWMU 5 Surface			
General Statistics			
Number of Valid Samples	56	Number of Detected Data	30
Number of Unique Samples	30	Number of Non-Detect Data	26
		Percent Non-Detects	46.43%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.213	Minimum Detected	-1.546
Maximum Detected	80	Maximum Detected	4.382
Mean of Detected	11.05	Mean of Detected	1.183
SD of Detected	19.68	SD of Detected	1.575
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	28
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	28
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	50.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.587	Lilliefors Test Statistic	0.947
5% Lilliefors Critical Value	0.927	5% Lilliefors Critical Value	0.927
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	6.034	Mean	-0.025
SD	15.29	SD	1.738
95% DL/2 (t) UCL	9.453	95% H-Stat (DL/2) UCL	3.904
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.356
		SD in Log Scale	2.134
		Mean in Original Scale	6.005
		SD in Original Scale	15.3
		95% Percentile Bootstrap UCL	9.643
		95% BCA Bootstrap UCL	10.9
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.488	Data appear Lognormal at 5% Significance Level	
Theta Star	22.64		
nu star	29.3		
A-D Test Statistic	1.705	Nonparametric Statistics	
5% A-D Critical Value	0.808	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.808	Mean	6.062
5% K-S Critical Value	0.169	SD	15.14
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.058
		95% KM (t) UCL	9.506
Assuming Gamma Distribution		95% KM (z) UCL	9.448
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	9.479
Minimum	0	95% KM (bootstrap t) UCL	13.18
Maximum	80	95% KM (BCA) UCL	9.565
Mean	10.32	95% KM (Percentile Bootstrap) UCL	9.566

Median	3.316	95% KM (Chebyshev) UCL	15.03
SD	15.89	97.5% KM (Chebyshev) UCL	18.92
k star	0.216	99% KM (Chebyshev) UCL	26.54
Theta star	47.74		
Nu star	24.2	Potential UCLs to Use	
AppChi2	14	**97.5% KM (Chebyshev) UCL**	**18.92**
95% Gamma Approximate UCL	17.83		
95% Adjusted Gamma UCL	18.1		
Note: DL/2 is not a recommended method.			

Benzo(b)fluoranthene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	C:\aaa\Benzo(a)pyrene.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Benzo(b)fluoranthene SWMU 5 Surface

General Statistics			
Number of Valid Samples	55	Number of Detected Data	29
Number of Unique Samples	29	Number of Non-Detect Data	26
		Percent Non-Detects	47.27%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.66	Minimum Detected	-0.416
Maximum Detected	170	Maximum Detected	5.136
Mean of Detected	18.11	Mean of Detected	1.566
SD of Detected	36.25	SD of Detected	1.592
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	26
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	29
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	47.27%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.537	Lilliefors Test Statistic	0.911
5% Lilliefors Critical Value	0.926	5% Lilliefors Critical Value	0.926
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.665	Mean	0.155
SD	27.61	SD	1.891
95% DL/2 (t) UCL	15.9	95% H-Stat (DL/2) UCL	5.023
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.431
		SD in Log Scale	2.546
		Mean in Original Scale	9.607
		SD in Original Scale	27.63
		95% Percentile Bootstrap UCL	16.75
		95% BCA Bootstrap UCL	19.55
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.454	Data do not follow a Discernable Distribution (0.05)	
Theta Star	39.94		
nu star	26.31		
A-D Test Statistic	2.032	Nonparametric Statistics	
5% A-D Critical Value	0.816	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.816	Mean	9.863
5% K-S Critical Value	0.173	SD	27.29
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.746
		95% KM (t) UCL	16.13
Assuming Gamma Distribution		95% KM (z) UCL	16.02
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.04
Minimum	0	95% KM (bootstrap t) UCL	23.31
Maximum	170	95% KM (BCA) UCL	16.74
Mean	15.96	95% KM (Percentile Bootstrap) UCL	16.49

Median	3.3	95% KM (Chebyshev) UCL	26.19
SD	28.4	97.5% KM (Chebyshev) UCL	33.25
k star	0.159	99% KM (Chebyshev) UCL	47.13
Theta star	100.3		
Nu star	17.5	Potential UCLs to Use	
AppChi2	9.034	**97.5% KM (Chebyshev) UCL**	**33.25**
95% Gamma Approximate UCL	30.93		
95% Adjusted Gamma UCL	31.51		
Note: DL/2 is not a recommended method.			

Benzo(k)fluoranthene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Benzo(k)fluoranthene SWMU 5 Surface

General Statistics

Number of Valid Samples	15	Number of Detected Data	6
Number of Unique Samples	6	Number of Non-Detect Data	9
		Percent Non-Detects	60.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.277	Minimum Detected	-1.284
Maximum Detected	11.7	Maximum Detected	2.46
Mean of Detected	3.646	Mean of Detected	0.515
SD of Detected	4.531	SD of Detected	1.449
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	73.33%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.799	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.606	Mean	-0.634
SD	3.21	SD	1.301
95% DL/2 (t) UCL	3.066	95% H-Stat (DL/2) UCL	2.641
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.609
		SD in Log Scale	1.443
		Mean in Original Scale	1.668
		SD in Original Scale	3.19
		95% Percentile Bootstrap UCL	3.109
		95% BCA Bootstrap UCL	3.846
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.494	Data appear Normal at 5% Significance Level	
Theta Star	7.374		
nu star	5.933		
A-D Test Statistic	0.297	Nonparametric Statistics	
5% A-D Critical Value	0.721	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.721	Mean	1.661
5% K-S Critical Value	0.343	SD	3.078
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.872
		95% KM (t) UCL	3.196
Assuming Gamma Distribution		95% KM (z) UCL	3.094
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.067
Minimum	0	95% KM (bootstrap t) UCL	8.454
Maximum	11.7	95% KM (BCA) UCL	3.862
Mean	3.344	95% KM (Percentile Bootstrap) UCL	3.43

Median	3.343	95% KM (Chebyshev) UCL	5.459
SD	3.015	97.5% KM (Chebyshev) UCL	7.103
k star	0.346	99% KM (Chebyshev) UCL	10.33
Theta star	9.655		
Nu star	10.39	Potential UCLs to Use	
AppChi2	4.188	95% KM (t) UCL	3.196
95% Gamma Approximate UCL	8.298	**95% KM (Percentile Bootstrap) UCL**	**3.43**
95% Adjusted Gamma UCL	9.354		
Note: DL/2 is not a recommended method.			

Bis(2-ethylhexyl)phthalate SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Benzo(k)fluoranthene.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Bis(2-ethylhexyl)phthalate SWMU 5 Surface

General Statistics			
Number of Valid Samples	56	Number of Detected Data	18
Number of Unique Samples	10	Number of Non-Detect Data	38
		Percent Non-Detects	67.86%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	4.4	Minimum Detected	1.482
Maximum Detected	5.7	Maximum Detected	1.74
Mean of Detected	4.906	Mean of Detected	1.589
SD of Detected	0.296	SD of Detected	0.0591
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.98	Maximum Non-Detect	-0.0202
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	38
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	18
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	67.86%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.938	Lilliefors Test Statistic	0.954
5% Lilliefors Critical Value	0.897	5% Lilliefors Critical Value	0.897
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.746	Mean	-0.438
SD	2.201	SD	1.411
95% DL/2 (t) UCL	2.238	95% H-Stat (DL/2) UCL	1.377
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	4.906	Mean in Log Scale	1.456
SD	0.288	SD in Log Scale	0.112
95% MLE (t) UCL	4.97	Mean in Original Scale	4.317
95% MLE (Tiku) UCL	N/A	SD in Original Scale	0.492
		95% Percentile Bootstrap UCL	4.423
		95% BCA Bootstrap UCL	4.433
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	249.7	Data appear Normal at 5% Significance Level	
Theta Star	0.0196		
nu star	8991		
A-D Test Statistic	0.383	Nonparametric Statistics	
5% A-D Critical Value	0.737	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.737	Mean	4.563
5% K-S Critical Value	0.203	SD	0.287
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0395
		95% KM (t) UCL	4.629
Assuming Gamma Distribution		95% KM (z) UCL	4.627
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	4.668
Minimum	4.4	95% KM (bootstrap t) UCL	4.632
Maximum	5.7	95% KM (BCA) UCL	4.78
Mean	4.906	95% KM (Percentile Bootstrap) UCL	4.757

Median	4.906	95% KM (Chebyshev) UCL	4.734
SD	0.165	97.5% KM (Chebyshev) UCL	4.809
k star	877.6	99% KM (Chebyshev) UCL	4.955
Theta star	0.00559		
Nu star	98295	Potential UCLs to Use	
AppChi2	97567	95% KM (t) UCL	4.629
95% Gamma Approximate UCL	4.943	**95% KM (Percentile Bootstrap) UCL**	**4.757**
95% Adjusted Gamma UCL	4.944		

Note: DL/2 is not a recommended method.

Carbazole SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	P:\Project Files\Paducah_gmcmanus\BGOU\SWMU 5\ProUCL Data\Beryllium.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Carbazole SWMU 5 Surface

General Statistics

Number of Valid Samples	56	Number of Detected Data	11
Number of Unique Samples	10	Number of Non-Detect Data	45
		Percent Non-Detects	80.36%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.55	Minimum Detected	-0.598
Maximum Detected	71	Maximum Detected	4.263
Mean of Detected	13.01	Mean of Detected	1.406
SD of Detected	21.86	SD of Detected	1.651
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693

Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	45
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	80.36%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.625	Lilliefors Test Statistic	0.924
5% Lilliefors Critical Value	0.85	5% Lilliefors Critical Value	0.85
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.751	Mean	-0.862
SD	10.64	SD	1.333
95% DL/2 (t) UCL	5.129	95% H-Stat (DL/2) UCL	1.076

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.245
		SD in Log Scale	3.742
		Mean in Original Scale	2.58
		SD in Original Scale	10.68
		95% Percentile Bootstrap UCL	5.212
		95% BCA Bootstrap UCL	6.454

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.454	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	28.66		
nu star	9.988		

		Nonparametric Statistics	
A-D Test Statistic	0.592		
5% A-D Critical Value	0.778	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.778	Mean	2.998
5% K-S Critical Value	0.268	SD	10.48
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.469
		95% KM (t) UCL	5.456
Assuming Gamma Distribution		95% KM (z) UCL	5.414
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	5.333
Minimum	0	95% KM (bootstrap t) UCL	15.48
Maximum	71	95% KM (BCA) UCL	5.983
Mean	17.88	95% KM (Percentile Bootstrap) UCL	5.795

Median	10.17	95% KM (Chebyshev) UCL	9.401
SD	19	97.5% KM (Chebyshev) UCL	12.17
k star	0.254	99% KM (Chebyshev) UCL	17.61
Theta star	70.42		
Nu star	28.44	Potential UCLs to Use	
AppChi2	17.27	**95% KM (t) UCL**	**5.456**
95% Gamma Approximate UCL	29.45		
95% Adjusted Gamma UCL	29.85		
Note: DL/2 is not a recommended method.			

Chrysene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Chrysene SWMU 5 Surface

General Statistics			
Number of Valid Samples	56	Number of Detected Data	30
Number of Unique Samples	28	Number of Non-Detect Data	26
		Percent Non-Detects	46.43%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.225	Minimum Detected	-1.492
Maximum Detected	95	Maximum Detected	4.554
Mean of Detected	10.21	Mean of Detected	1.324
SD of Detected	18.58	SD of Detected	1.392
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	27
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	29
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	48.21%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.547	Lilliefors Test Statistic	0.958
5% Lilliefors Critical Value	0.927	5% Lilliefors Critical Value	0.927
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.583	Mean	0.0509
SD	14.4	SD	1.711
95% DL/2 (t) UCL	8.801	95% H-Stat (DL/2) UCL	3.432
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.211
		SD in Log Scale	2.052
		Mean in Original Scale	5.562
		SD in Original Scale	14.4
		95% Percentile Bootstrap UCL	9.142
		95% BCA Bootstrap UCL	10.64
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.577	Data appear Lognormal at 5% Significance Level	
Theta Star	17.7		
nu star	34.6		
A-D Test Statistic	1.576	Nonparametric Statistics	
5% A-D Critical Value	0.799	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.799	Mean	5.575
5% K-S Critical Value	0.168	SD	14.27
Data not Gamma Distributed at 5% Significance Level		SE of Mean	1.939
		95% KM (t) UCL	8.819
Assuming Gamma Distribution		95% KM (z) UCL	8.765
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8.57
Minimum	0	95% KM (bootstrap t) UCL	12.01
Maximum	95	95% KM (BCA) UCL	9.573
Mean	9.25	95% KM (Percentile Bootstrap) UCL	9.311

Median	3.45	95% KM (Chebyshev) UCL	14.03
SD	14.72	97.5% KM (Chebyshev) UCL	17.69
k star	0.221	99% KM (Chebyshev) UCL	24.87
Theta star	41.79		
Nu star	24.79	Potential UCLs to Use	
AppChi2	14.45	**95% KM (Chebyshev) UCL**	**14.03**
95% Gamma Approximate UCL	15.87		
95% Adjusted Gamma UCL	16.1		
Note: DL/2 is not a recommended method.			

Indeno(1,2,3-cd)pyrene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Fluoranthene.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Indeno(1,2,3-cd)pyrene SWMU 5 Surface

General Statistics			
Number of Valid Samples	56	Number of Detected Data	25
Number of Unique Samples	22	Number of Non-Detect Data	31
		Percent Non-Detects	55.36%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.62	Minimum Detected	-0.478
Maximum Detected	37	Maximum Detected	3.611
Mean of Detected	5.446	Mean of Detected	0.926
SD of Detected	8.325	SD of Detected	1.196
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	31
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	25
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	55.36%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.62	Lilliefors Test Statistic	0.905
5% Lilliefors Critical Value	0.918	5% Lilliefors Critical Value	0.918
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.565	Mean	-0.371
SD	6.087	SD	1.416
95% DL/2 (t) UCL	3.926	95% H-Stat (DL/2) UCL	1.506
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-0.975
		SD in Log Scale	2.052
		Mean in Original Scale	2.501
		SD in Original Scale	6.113
		95% Percentile Bootstrap UCL	3.926
		95% BCA Bootstrap UCL	4.425
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.709	Data do not follow a Discernable Distribution (0.05)	
Theta Star	7.682		
nu star	35.45		
A-D Test Statistic	1.48	Nonparametric Statistics	
5% A-D Critical Value	0.782	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.782	Mean	2.774
5% K-S Critical Value	0.181	SD	5.955
Data not Gamma Distributed at 5% Significance Level		SE of Mean	0.812
		95% KM (t) UCL	4.133
Assuming Gamma Distribution		95% KM (z) UCL	4.11
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	4.1
Minimum	0.62	95% KM (bootstrap t) UCL	5.537
Maximum	37	95% KM (BCA) UCL	4.307
Mean	5.302	95% KM (Percentile Bootstrap) UCL	4.136

Median	4.72	95% KM (Chebyshev) UCL	6.314
SD	5.613	97.5% KM (Chebyshev) UCL	7.846
k star	1.43	99% KM (Chebyshev) UCL	10.86
Theta star	3.709		
Nu star	160.1	Potential UCLs to Use	
AppChi2	131.9	**95% KM (BCA) UCL**	**4.307**
95% Gamma Approximate UCL	6.438		
95% Adjusted Gamma UCL	6.471		

Note: DL/2 is not a recommended method.

Pyrene SWMU 5 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	C:\aaa\Indeno(1,2,3-cd)pyrene.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Pyrene SWMU 5 Surface

General Statistics			
Number of Valid Samples	56	Number of Detected Data	35
Number of Unique Samples	35	Number of Non-Detect Data	21
		Percent Non-Detects	37.50%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.283	Minimum Detected	-1.262
Maximum Detected	150	Maximum Detected	5.011
Mean of Detected	15.22	Mean of Detected	1.301
SD of Detected	31.99	SD of Detected	1.654
Minimum Non-Detect	0.46	Minimum Non-Detect	-0.777
Maximum Non-Detect	0.5	Maximum Non-Detect	-0.693
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	23
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	33
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	41.07%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Lilliefors Test Statistic	0.516	Lilliefors Test Statistic	0.949
5% Lilliefors Critical Value	0.934	5% Lilliefors Critical Value	0.934
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.605	Mean	0.283
SD	26.19	SD	1.858
95% DL/2 (t) UCL	15.46	95% H-Stat (DL/2) UCL	6.368
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.019
		SD in Log Scale	2.186
		Mean in Original Scale	9.577
		SD in Original Scale	26.2
		95% Percentile Bootstrap UCL	15.74
		95% BCA Bootstrap UCL	17.12
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.434	Data appear Lognormal at 5% Significance Level	
Theta Star	35.1		
nu star	30.36		
A-D Test Statistic	2.184	Nonparametric Statistics	
5% A-D Critical Value	0.823	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.823	Mean	9.625
5% K-S Critical Value	0.158	SD	25.95
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.518
		95% KM (t) UCL	15.51
Assuming Gamma Distribution		95% KM (z) UCL	15.41
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	15.48
Minimum	0	95% KM (bootstrap t) UCL	22.37
Maximum	150	95% KM (BCA) UCL	15.59
Mean	10.53	95% KM (Percentile Bootstrap) UCL	15.89

Median	2.15	95% KM (Chebyshev) UCL	24.96
SD	26.01	97.5% KM (Chebyshev) UCL	31.6
k star	0.134	99% KM (Chebyshev) UCL	44.63
Theta star	78.65		
Nu star	14.99	Potential UCLs to Use	
AppChi2	7.255	**97.5% KM (Chebyshev) UCL**	**31.6**
95% Gamma Approximate UCL	21.75		
95% Adjusted Gamma UCL	22.19		
Note: DL/2 is not a recommended method.			

U-238 SWMU 5 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

U-238 SWMU 5 Surface

General Statistics			
Number of Valid Samples	12	Number of Unique Samples	12
Raw Statistics		Log-transformed Statistics	
Minimum	0.647	Minimum of Log Data	-0.435
Maximum	1.68	Maximum of Log Data	0.519
Mean	1.201	Mean of log Data	0.14
Median	1.21	SD of log Data	0.319
SD	0.344		
Coefficient of Variation	0.287		
Skewness	-0.362		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.941	Shapiro Wilk Test Statistic	0.906
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	1.379	95% H-UCL	1.459
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.694
95% Adjusted-CLT UCL	1.353	97.5% Chebyshev (MVUE) UCL	1.905
95% Modified-t UCL	1.378	99% Chebyshev (MVUE) UCL	2.321
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	8.831	Data appear Normal at 5% Significance Level	
Theta Star	0.136		
nu star	211.9		
Approximate Chi Square Value (.05)	179.2	Nonparametric Statistics	
Adjusted Level of Significance	0.029	95% CLT UCL	1.364
Adjusted Chi Square Value	174.7	95% Jackknife UCL	1.379
		95% Standard Bootstrap UCL	1.356
Anderson-Darling Test Statistic	0.41	95% Bootstrap-t UCL	1.362
Anderson-Darling 5% Critical Value	0.731	95% Hall's Bootstrap UCL	1.343
Kolmogorov-Smirnov Test Statistic	0.178	95% Percentile Bootstrap UCL	1.351
Kolmogorov-Smirnov 5% Critical Value	0.245	95% BCA Bootstrap UCL	1.349
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.634
		97.5% Chebyshev(Mean, Sd) UCL	1.822
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.19
95% Approximate Gamma UCL	1.42		
95% Adjusted Gamma UCL	1.457		
Potential UCL to Use		**Use 95% Student's-t UCL**	**1.379**

SWMU 5 SUBSURFACE SAMPLES

Al SWMU 5 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	P:\Project Files\Paducah_gmcmanus\BGOU\SWMU 5\ProUCL Data\Metals Exc SWMU.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Al SWMU 5 Subsurface

General Statistics

Number of Valid Samples	28	Number of Unique Samples	26
Raw Statistics		Log-transformed Statistics	
Minimum	2430	Minimum of Log Data	7.796
Maximum	13800	Maximum of Log Data	9.532
Mean	7672	Mean of log Data	8.868
Median	7830	SD of log Data	0.417
SD	2919		
Coefficient of Variation	0.381		
Skewness	0.383		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.964	Shapiro Wilk Test Statistic	0.956
Shapiro Wilk Critical Value	0.924	Shapiro Wilk Critical Value	0.924
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	8611	95% H-UCL	9009
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10452
95% Adjusted-CLT UCL	8622	97.5% Chebyshev (MVUE) UCL	11635
95% Modified-t UCL	8618	99% Chebyshev (MVUE) UCL	13957
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.952	Data appear Normal at 5% Significance Level	
Theta Star	1289		
nu star	333.3		
Approximate Chi Square Value (.05)	292	Nonparametric Statistics	
Adjusted Level of Significance	0.0404	95% CLT UCL	8579
Adjusted Chi Square Value	289.6	95% Jackknife UCL	8611
		95% Standard Bootstrap UCL	8550
Anderson-Darling Test Statistic	0.315	95% Bootstrap-t UCL	8622
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	8601
Kolmogorov-Smirnov Test Statistic	0.113	95% Percentile Bootstrap UCL	8557
Kolmogorov-Smirnov 5% Critical Value	0.166	95% BCA Bootstrap UCL	8591
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10076
		97.5% Chebyshev(Mean, Sd) UCL	11117
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13161
95% Approximate Gamma UCL	8757		
95% Adjusted Gamma UCL	8829		
Potential UCL to Use		**Use 95% Student's-t UCL**	**8611**

SWMU 6 SURFACE SAMPLES

Aluminum SWMU 6 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	P:\Project Files\Paducah_gmcmanus\BGOU\SWMU 6\ProUCL Files\Aluminum SWMU 6.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum SWMU 6 Surface

General Statistics

Number of Valid Samples	15	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	5290	Minimum of Log Data	8.574
Maximum	11200	Maximum of Log Data	9.324
Mean	8393	Mean of log Data	9.013
Median	8000	SD of log Data	0.223
SD	1802		
Coefficient of Variation	0.215		
Skewness	-0.0377		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.962	Shapiro Wilk Test Statistic	0.958
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	9213	95% H-UCL	9379
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	10519
95% Adjusted-CLT UCL	9154	97.5% Chebyshev (MVUE) UCL	11437
95% Modified-t UCL	9212	99% Chebyshev (MVUE) UCL	13240
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	17.9	Data appear Normal at 5% Significance Level	
Theta Star	468.9		
nu star	537		
Approximate Chi Square Value (.05)	484.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0324	95% CLT UCL	9159
Adjusted Chi Square Value	478.1	95% Jackknife UCL	9213
		95% Standard Bootstrap UCL	9126
Anderson-Darling Test Statistic	0.259	95% Bootstrap-t UCL	9195
Anderson-Darling 5% Critical Value	0.735	95% Hall's Bootstrap UCL	9124
Kolmogorov-Smirnov Test Statistic	0.126	95% Percentile Bootstrap UCL	9113
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	9119
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10422
		97.5% Chebyshev(Mean, Sd) UCL	11299
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	13023
95% Approximate Gamma UCL	9308		
95% Adjusted Gamma UCL	9428		
Potential UCL to Use		**Use 95% Student's-t UCL**	**9213**

Nickel SWMU 6 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	C:\aaa\Aluminum SWMU 6.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nickel SWMU 6 Surface

General Statistics

Number of Valid Samples	15	Number of Detected Data	13
Number of Unique Samples	12	Number of Non-Detect Data	2
		Percent Non-Detects	13.33%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	6.07	Minimum Detected	1.803
Maximum Detected	43.2	Maximum Detected	3.766
Mean of Detected	11.61	Mean of Detected	2.272
SD of Detected	9.918	SD of Detected	0.541
Minimum Non-Detect	5	Minimum Non-Detect	1.609
Maximum Non-Detect	5	Maximum Non-Detect	1.609

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.56	Shapiro Wilk Test Statistic	0.788
5% Shapiro Wilk Critical Value	0.866	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.39	Mean	2.091
SD	9.726	SD	0.691
95% DL/2 (t) UCL	14.82	95% H-Stat (DL/2) UCL	10.82
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	9.856	Mean in Log Scale	2.114
SD	10.12	SD in Log Scale	0.653
95% MLE (t) UCL	14.46	Mean in Original Scale	10.46
95% MLE (Tiku) UCL	14.25	SD in Original Scale	9.672
		95% Percentile Bootstrap UCL	14.81
		95% BCA Bootstrap UCL	17.23
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.308	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.03		
nu star	60.01		
A-D Test Statistic	1.32	Nonparametric Statistics	
5% A-D Critical Value	0.739	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.739	Mean	10.87
5% K-S Critical Value	0.238	SD	9.069
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	2.437
		95% KM (t) UCL	15.16
Assuming Gamma Distribution		95% KM (z) UCL	14.88
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	15.11
Minimum	0.195	95% KM (bootstrap t) UCL	23.67
Maximum	43.2	95% KM (BCA) UCL	15.81
Mean	10.25	95% KM (Percentile Bootstrap) UCL	15.23
Median	7.15	95% KM (Chebyshev) UCL	21.49
SD	9.872	97.5% KM (Chebyshev) UCL	26.09
k star	1.15	99% KM (Chebyshev) UCL	35.12

Theta star	8.914		
Nu star	34.49	Potential UCLs to Use	
AppChi2	22.05	**95% KM (BCA) UCL**	**15.81**
95% Gamma Approximate UCL	16.02		
95% Adjusted Gamma UCL	16.96		
Note: DL/2 is not a recommended method.			

SWMU 7 SURFACE SAMPLES

Al SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Al SWMU 7 Surface

General Statistics

Number of Valid Samples	14	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	2900	Minimum of Log Data	7.972
Maximum	14000	Maximum of Log Data	9.547
Mean	7721	Mean of log Data	8.874
Median	7990	SD of log Data	0.43
SD	2918		
Coefficient of Variation	0.378		
Skewness	0.22		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Test Statistic	0.93
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	9102	95% H-UCL	9968
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	11762
95% Adjusted-CLT UCL	9053	97.5% Chebyshev (MVUE) UCL	13484
95% Modified-t UCL	9110	99% Chebyshev (MVUE) UCL	16866
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.261	Data appear Normal at 5% Significance Level	
Theta Star	1468		
nu star	147.3		
Approximate Chi Square Value (.05)	120.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	9004
Adjusted Chi Square Value	117	95% Jackknife UCL	9102
		95% Standard Bootstrap UCL	8964
Anderson-Darling Test Statistic	0.374	95% Bootstrap-t UCL	9154
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	9244
Kolmogorov-Smirnov Test Statistic	0.179	95% Percentile Bootstrap UCL	8944
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	8951
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	11121
		97.5% Chebyshev(Mean, Sd) UCL	12592
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	15482
95% Approximate Gamma UCL	9457		
95% Adjusted Gamma UCL	9719		
Potential UCL to Use		**Use 95% Student's-t UCL**	**9102**

Arsenic SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File			
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Arsenic SWMU 7 Surface			
General Statistics			
Number of Valid Samples	14	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	2.4	Minimum of Log Data	0.875
Maximum	16	Maximum of Log Data	2.773
Mean	5.237	Mean of log Data	1.513
Median	4.4	SD of log Data	0.518
SD	3.482		
Coefficient of Variation	0.665		
Skewness	2.497		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.72	Shapiro Wilk Test Statistic	0.922
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	6.885	95% H-UCL	7.037
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	8.335
95% Adjusted-CLT UCL	7.432	97.5% Chebyshev (MVUE) UCL	9.718
95% Modified-t UCL	6.989	99% Chebyshev (MVUE) UCL	12.43
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.931	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.787		
nu star	82.07		
Approximate Chi Square Value (.05)	62.19	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	6.768
Adjusted Chi Square Value	59.9	95% Jackknife UCL	6.885
		95% Standard Bootstrap UCL	6.67
Anderson-Darling Test Statistic	0.551	95% Bootstrap-t UCL	8.462
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	13.28
Kolmogorov-Smirnov Test Statistic	0.136	95% Percentile Bootstrap UCL	6.814
Kolmogorov-Smirnov 5% Critical Value	0.23	95% BCA Bootstrap UCL	7.634
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	9.294
		97.5% Chebyshev(Mean, Sd) UCL	11.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	14.5
95% Approximate Gamma UCL	6.911		
95% Adjusted Gamma UCL	7.175		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**6.911**

Chromium SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File			
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Chromium SWMU 7 Surface			
General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	16	Minimum of Log Data	2.773
Maximum	55.8	Maximum of Log Data	4.022
Mean	26.63	Mean of log Data	3.202
Median	22.5	SD of log Data	0.399
SD	11.93		
Coefficient of Variation	0.448		
Skewness	1.284		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.835	Shapiro Wilk Test Statistic	0.897
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	31.86	95% H-UCL	32.56
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	38.22
95% Adjusted-CLT UCL	32.56	97.5% Chebyshev (MVUE) UCL	43.31
95% Modified-t UCL	32.02	99% Chebyshev (MVUE) UCL	53.29
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.231	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5.091		
nu star	167.4		
Approximate Chi Square Value (.05)	138.5	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	31.54
Adjusted Chi Square Value	135.5	95% Jackknife UCL	31.86
		95% Standard Bootstrap UCL	31.28
Anderson-Darling Test Statistic	0.76	95% Bootstrap-t UCL	33.79
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	32.63
Kolmogorov-Smirnov Test Statistic	0.187	95% Percentile Bootstrap UCL	31.6
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	32.55
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.63
		97.5% Chebyshev(Mean, Sd) UCL	45.25
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	56.3
95% Approximate Gamma UCL	32.19		
95% Adjusted Gamma UCL	32.9		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**32.19**

Copper SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Copper SWMU 7 Surface

General Statistics			
Number of Valid Samples	14	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	6.1	Minimum of Log Data	1.808
Maximum	99	Maximum of Log Data	4.595
Mean	32.35	Mean of log Data	3.065
Median	15.5	SD of log Data	0.939
SD	30.67		
Coefficient of Variation	0.948		
Skewness	1.167		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.798	Shapiro Wilk Test Statistic	0.907
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	46.86	95% H-UCL	67.26
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	69.6
95% Adjusted-CLT UCL	48.56	97.5% Chebyshev (MVUE) UCL	85.89
95% Modified-t UCL	47.29	99% Chebyshev (MVUE) UCL	117.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.114	Data appear Lognormal at 5% Significance Level	
Theta Star	29.05		
nu star	31.18		
Approximate Chi Square Value (.05)	19.43	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	45.83
Adjusted Chi Square Value	18.2	95% Jackknife UCL	46.86
		95% Standard Bootstrap UCL	45.43
Anderson-Darling Test Statistic	0.819	95% Bootstrap-t UCL	51.38
Anderson-Darling 5% Critical Value	0.753	95% Hall's Bootstrap UCL	47.05
Kolmogorov-Smirnov Test Statistic	0.269	95% Percentile Bootstrap UCL	46.19
Kolmogorov-Smirnov 5% Critical Value	0.233	95% BCA Bootstrap UCL	48.3
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	68.07
		97.5% Chebyshev(Mean, Sd) UCL	83.53
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	113.9
95% Approximate Gamma UCL	51.93		
95% Adjusted Gamma UCL	55.42		
Potential UCL to Use		**Use 95% H-UCL**	**67.26**

Iron SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File			
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Iron SWMU 7 Surface			
General Statistics			
Number of Valid Samples	14	Number of Unique Samples	12
Raw Statistics		Log-transformed Statistics	
Minimum	6100	Minimum of Log Data	8.716
Maximum	30000	Maximum of Log Data	10.31
Mean	15850	Mean of log Data	9.579
Median	14000	SD of log Data	0.448
SD	7085		
Coefficient of Variation	0.447		
Skewness	0.813		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.917	Shapiro Wilk Test Statistic	0.966
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	19203	95% H-UCL	20593
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24339
95% Adjusted-CLT UCL	19404	97.5% Chebyshev (MVUE) UCL	28005
95% Modified-t UCL	19272	99% Chebyshev (MVUE) UCL	35207
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.46	Data appear Normal at 5% Significance Level	
Theta Star	3554		
nu star	124.9		
Approximate Chi Square Value (.05)	100.1	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	18965
Adjusted Chi Square Value	97.12	95% Jackknife UCL	19203
		95% Standard Bootstrap UCL	18881
Anderson-Darling Test Statistic	0.318	95% Bootstrap-t UCL	19808
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	19871
Kolmogorov-Smirnov Test Statistic	0.201	95% Percentile Bootstrap UCL	18793
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	19364
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	24104
		97.5% Chebyshev(Mean, Sd) UCL	27675
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	34690
95% Approximate Gamma UCL	19780		
95% Adjusted Gamma UCL	20379		
Potential UCL to Use		**Use 95% Student's-t UCL**	**19203**

Lead SWMU 7 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead SWMU 7 Surface

General Statistics

Number of Valid Samples	14	Number of Detected Data	13
Number of Unique Samples	12	Number of Non-Detect Data	1
		Percent Non-Detects	7.14%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	4.7	Minimum Detected	1.548
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	25.53	Mean of Detected	2.902
SD of Detected	29.37	SD of Detected	0.791
Minimum Non-Detect	7.93	Minimum Non-Detect	2.071
Maximum Non-Detect	7.93	Maximum Non-Detect	2.071

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.557	Shapiro Wilk Test Statistic	0.911
5% Shapiro Wilk Critical Value	0.866	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	23.99	Mean	2.793
SD	28.8	SD	0.863
95% DL/2 (t) UCL	37.62	95% H-Stat (DL/2) UCL	38.41

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	19.9	Mean in Log Scale	2.819
SD	32.43	SD in Log Scale	0.821
95% MLE (t) UCL	35.25	Mean in Original Scale	24.11
95% MLE (Tiku) UCL	35.14	SD in Original Scale	28.71
		95% Percentile Bootstrap UCL	38.08
		95% BCA Bootstrap UCL	45.36

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.302	Data appear Lognormal at 5% Significance Level	
Theta Star	19.61		
nu star	33.85		
A-D Test Statistic	0.932	Nonparametric Statistics	
5% A-D Critical Value	0.749	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.749	Mean	24.11
5% K-S Critical Value	0.241	SD	27.67
Data not Gamma Distributed at 5% Significance Level		SE of Mean	7.698
		95% KM (t) UCL	37.74
Assuming Gamma Distribution		95% KM (z) UCL	36.77
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	37.7
Minimum	0	95% KM (bootstrap t) UCL	60.49
Maximum	120	95% KM (BCA) UCL	39.55
Mean	23.71	95% KM (Percentile Bootstrap) UCL	38.14
Median	19.5	95% KM (Chebyshev) UCL	57.66
SD	29.03	97.5% KM (Chebyshev) UCL	72.18
k star	0.319	99% KM (Chebyshev) UCL	100.7

Theta star	74.33		
Nu star	8.931	Potential UCLs to Use	
AppChi2	3.285	**95% KM (Chebyshev) UCL**	**57.66**
95% Gamma Approximate UCL	64.45		
95% Adjusted Gamma UCL	74.38		
Note: DL/2 is not a recommended method.			

Nickel SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Nickel SWMU 7 Surface

General Statistics

Number of Valid Samples	14	Number of Unique Samples	13
Raw Statistics		Log-transformed Statistics	
Minimum	7.1	Minimum of Log Data	1.96
Maximum	140	Maximum of Log Data	4.942
Mean	32.45	Mean of log Data	3.094
Median	17.5	SD of log Data	0.861
SD	35.36		
Coefficient of Variation	1.09		
Skewness	2.452		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.697	Shapiro Wilk Test Statistic	0.95
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	49.19	95% H-UCL	59.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	64.04
95% Adjusted-CLT UCL	54.61	97.5% Chebyshev (MVUE) UCL	78.38
95% Modified-t UCL	50.22	99% Chebyshev (MVUE) UCL	106.6
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.18	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	27.5		
nu star	33.04		
Approximate Chi Square Value (.05)	20.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	47.99
Adjusted Chi Square Value	19.63	95% Jackknife UCL	49.19
		95% Standard Bootstrap UCL	47.23
Anderson-Darling Test Statistic	0.583	95% Bootstrap-t UCL	66.79
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	103.6
Kolmogorov-Smirnov Test Statistic	0.209	95% Percentile Bootstrap UCL	49.09
Kolmogorov-Smirnov 5% Critical Value	0.233	95% BCA Bootstrap UCL	54.94
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	73.64
		97.5% Chebyshev(Mean, Sd) UCL	91.47
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	126.5
95% Approximate Gamma UCL	51.3		
95% Adjusted Gamma UCL	54.63		

Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**51.3**

Uranium SWMU 7 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From			
File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Uranium SWMU 7 Surface

General Statistics			
Number of Valid Samples	16	Number of Detected Data	12
Number of Unique Samples	11	Number of Non-Detect Data	4
		Percent Non-Detects	25.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	50	Minimum Detected	3.912
Maximum Detected	1170	Maximum Detected	7.065
Mean of Detected	269.5	Mean of Detected	5.214
SD of Detected	306.1	SD of Detected	0.852
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	1270	Maximum Non-Detect	7.147
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	16
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.657	Shapiro Wilk Test Statistic	0.952
5% Shapiro Wilk Critical Value	0.859	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	246.3	Mean	4.728
SD	298.7	SD	1.68
95% DL/2 (t) UCL	377.2	95% H-Stat (DL/2) UCL	1704
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	4.876
		SD in Log Scale	1.009
		Mean in Original Scale	217.2
		SD in Original Scale	279.2
		95% Percentile Bootstrap UCL	331.4
		95% BCA Bootstrap UCL	419.1
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.145	Data appear Gamma Distributed at 5% Significance Level	
Theta			
Star	235.5		
nu star	27.47		
A-D Test Statistic	0.597	Nonparametric Statistics	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.747	Mean	227.2
5% K-S Critical Value	0.25	SD	275.6
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	74.33
		95% KM (t) UCL	357.5
Assuming Gamma Distribution		95% KM (z) UCL	349.5
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	352.3
Mini	0	95% KM (bootstrap t) UCL	531.7

mum			
Maxi			
mum	1170	95% KM (BCA) UCL	360.3
Mean	231.9	95% KM (Percentile Bootstrap) UCL	358.9
Media			
n	125	95% KM (Chebyshev) UCL	551.2
SD	281.3	97.5% KM (Chebyshev) UCL	691.4
k star	0.213	99% KM (Chebyshev) UCL	966.8
Theta			
star	1089		
Nu			
star	6.814	Potential UCLs to Use	
AppC			
hi2	2.069	**95% KM (Percentile Bootstrap) UCL**	**358.9**
95% Gamma Approximate UCL	763.6		
95% Adjusted Gamma UCL	885.2		
Note: DL/2 is not a recommended method.			

Vanadium SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File			
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Vanadium SWMU 7 Surface			
General Statistics			
Number of Valid Samples	14	Number of Unique Samples	12
Raw Statistics		Log-transformed Statistics	
Minimum	8.3	Minimum of Log Data	2.116
Maximum	52	Maximum of Log Data	3.951
Mean	23.01	Mean of log Data	3.036
Median	21	SD of log Data	0.477
SD	10.72		
Coefficient of Variation	0.466		
Skewness	1.345		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.882	Shapiro Wilk Test Statistic	0.927
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	28.09	95% H-UCL	30.68
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.32
95% Adjusted-CLT UCL	28.83	97.5% Chebyshev (MVUE) UCL	42.02
95% Modified-t UCL	28.26	99% Chebyshev (MVUE) UCL	53.22
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.115	Data appear Normal at 5% Significance Level	
Theta Star	5.592		
nu star	115.2		
Approximate Chi Square Value (.05)	91.44	Nonparametric Statistics	
Adjusted Level of Significance	0.0312	95% CLT UCL	27.73
Adjusted Chi Square Value	88.64	95% Jackknife UCL	28.09
		95% Standard Bootstrap UCL	27.55
Anderson-Darling Test Statistic	0.435	95% Bootstrap-t UCL	29.65
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	35.33
Kolmogorov-Smirnov Test Statistic	0.178	95% Percentile Bootstrap UCL	27.74
Kolmogorov-Smirnov 5% Critical Value	0.229	95% BCA Bootstrap UCL	28.39
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	35.5
		97.5% Chebyshev(Mean, Sd) UCL	40.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	51.52
95% Approximate Gamma UCL	29		
95% Adjusted Gamma UCL	29.92		
Potential UCL to Use		**Use 95% Student's-t UCL**	**28.09**

Tc-99 SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Tc-99 SWMU 7 Surface			
General Statistics			
Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.205	Minimum of Log Data	-1.585
Maximum	406	Maximum of Log Data	6.006
Mean	47.62	Mean of log Data	2.102
Median	4.42	SD of log Data	2.072
SD	100.2		
Coefficient of Variation	2.105		
Skewness	3.247		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.524	Shapiro Wilk Test Statistic	0.944
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	90.06	95% H-UCL	743.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	185.5
95% Adjusted-CLT UCL	108.1	97.5% Chebyshev (MVUE) UCL	243.5
95% Modified-t UCL	93.25	99% Chebyshev (MVUE) UCL	357.3
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.35	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	136.1		
nu star	11.9		
Approximate Chi Square Value (.05)	5.159	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	87.61
Adjusted Chi Square Value	4.701	95% Jackknife UCL	90.06
		95% Standard Bootstrap UCL	86.01
Anderson-Darling Test Statistic	0.925	95% Bootstrap-t UCL	188.4
Anderson-Darling 5% Critical Value	0.825	95% Hall's Bootstrap UCL	244.7
Kolmogorov-Smirnov Test Statistic	0.215	95% Percentile Bootstrap UCL	91.14
Kolmogorov-Smirnov 5% Critical Value	0.225	95% BCA Bootstrap UCL	112.6
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	153.6
		97.5% Chebyshev(Mean, Sd) UCL	199.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	289.5
95% Approximate Gamma UCL	109.8		
95% Adjusted Gamma UCL	120.5		
Potential UCL to Use		**Use 95% Adjusted Gamma UCL**	**120.5**

Th-230 SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Th-230 SWMU 7 Surface

General Statistics

Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	0.716	Minimum of Log Data	-0.334
Maximum	3.94	Maximum of Log Data	1.371
Mean	1.777	Mean of log Data	0.476
Median	1.68	SD of log Data	0.458
SD	0.846		
Coefficient of Variation	0.476		
Skewness	1.176		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.984
Shapiro Wilk Critical Value	0.892	Shapiro Wilk Critical Value	0.892
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	2.136	95% H-UCL	2.247
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.659
95% Adjusted-CLT UCL	2.177	97.5% Chebyshev (MVUE) UCL	3.041
95% Modified-t UCL	2.145	99% Chebyshev (MVUE) UCL	3.791
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	4.321	Data appear Normal at 5% Significance Level	
Theta Star	0.411		
nu star	146.9		
Approximate Chi Square Value (.05)	119.9	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	2.115
Adjusted Chi Square Value	117.3	95% Jackknife UCL	2.136
		95% Standard Bootstrap UCL	2.112
Anderson-Darling Test Statistic	0.221	95% Bootstrap-t UCL	2.252
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	2.359
Kolmogorov-Smirnov Test Statistic	0.14	95% Percentile Bootstrap UCL	2.116
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	2.179
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.672
		97.5% Chebyshev(Mean, Sd) UCL	3.059
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.819
95% Approximate Gamma UCL	2.178		
95% Adjusted Gamma UCL	2.225		
Potential UCL to Use		**Use 95% Student's-t UCL**	**2.136**

Np-237 SWMU 7 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Np-237 SWMU 7 Surface

General Statistics

Number of Valid Samples	19	Number of Detected Data	14
Number of Unique Samples	13	Number of Non-Detect Data	5
		Percent Non-Detects	26.32%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0775	Minimum Detected	-2.557
Maximum Detected	0.72	Maximum Detected	-0.329
Mean of Detected	0.297	Mean of Detected	-1.442
SD of Detected	0.199	SD of Detected	0.724
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.273	Maximum Non-Detect	-1.298
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	12
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	63.16%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.94
5% Shapiro Wilk Critical Value	0.874	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.23	Mean	-2.045
SD	0.207	SD	1.327
95% DL/2 (t) UCL	0.312	95% H-Stat (DL/2) UCL	0.371
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.186	Mean in Log Scale	-1.833
SD	0.264	SD in Log Scale	0.926
95% MLE (t) UCL	0.291	Mean in Original Scale	0.234
95% MLE (Tiku) UCL	0.342	SD in Original Scale	0.202
		95% Percentile Bootstrap UCL	0.314
		95% BCA Bootstrap UCL	0.322
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.887	Data appear Normal at 5% Significance Level	
Theta Star	0.157		
nu star	52.85		
A-D Test Statistic	0.385	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.745	Mean	0.241
5% K-S Critical Value	0.231	SD	0.19
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0453
		95% KM (t) UCL	0.32
Assuming Gamma Distribution		95% KM (z) UCL	0.316
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.318
Minimum	0.0775	95% KM (bootstrap t) UCL	0.337
Maximum	0.72	95% KM (BCA) UCL	0.315
Mean	0.25	95% KM (Percentile Bootstrap) UCL	0.32

Median	0.16	95% KM (Chebyshev) UCL	0.439
SD	0.192	97.5% KM (Chebyshev) UCL	0.525
k star	1.671	99% KM (Chebyshev) UCL	0.693
Theta star	0.15		
Nu star	63.49	Potential UCLs to Use	
AppChi2	46.16	95% KM (t) UCL	0.32
95% Gamma Approximate UCL	0.344	**95% KM (Percentile Bootstrap) UCL**	**0.32**
95% Adjusted Gamma UCL	0.354		
Note: DL/2 is not a recommended method.			

Pu-239 SWMU 7 Surface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Pu-239 SWMU 7 Surface

General Statistics			
Number of Valid Samples	19	Number of Detected Data	16
Number of Unique Samples	15	Number of Non-Detect Data	3
		Percent Non-Detects	15.79%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.02	Minimum Detected	-3.912
Maximum Detected	0.68	Maximum Detected	-0.386
Mean of Detected	0.205	Mean of Detected	-2.009
SD of Detected	0.181	SD of Detected	1.025
Minimum Non-Detect	0.01	Minimum Non-Detect	-4.605
Maximum Non-Detect	0.0368	Maximum Non-Detect	-3.302
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	14
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	26.32%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.865	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.887	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.174	Mean	-2.394
SD	0.18	SD	1.33
95% DL/2 (t) UCL	0.246	95% H-Stat (DL/2) UCL	0.323
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.143	Mean in Log Scale	-2.337
SD	0.217	SD in Log Scale	1.226
95% MLE (t) UCL	0.229	Mean in Original Scale	0.175
95% MLE (Tiku) UCL	0.232	SD in Original Scale	0.18
		95% Percentile Bootstrap UCL	0.248
		95% BCA Bootstrap UCL	0.258
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.118	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.183		
nu star	35.78		
A-D Test Statistic	0.27	Nonparametric Statistics	
5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.758	Mean	0.176
5% K-S Critical Value	0.22	SD	0.174
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.0413
		95% KM (t) UCL	0.247
Assuming Gamma Distribution		95% KM (z) UCL	0.244
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	0.246
Minimum	0	95% KM (bootstrap t) UCL	0.273
Maximum	0.68	95% KM (BCA) UCL	0.254
Mean	0.173	95% KM (Percentile Bootstrap) UCL	0.246

Median	0.13	95% KM (Chebyshev) UCL	0.356
SD	0.182	97.5% KM (Chebyshev) UCL	0.434
k star	0.392	99% KM (Chebyshev) UCL	0.587
Theta star	0.442		
Nu star	14.89	Potential UCLs to Use	
AppChi2	7.184	**95% KM (BCA) UCL**	**0.254**
95% Gamma Approximate UCL	0.359		
95% Adjusted Gamma UCL	0.384		
Note: DL/2 is not a recommended method.			

U-234 SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-234 SWMU 7 Surface

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	8.92	Minimum of Log Data	2.188
Maximum	318	Maximum of Log Data	5.762
Mean	48.39	Mean of log Data	3.324
Median	26.5	SD of log Data	0.972
SD	72.81		
Coefficient of Variation	1.505		
Skewness	3.343		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.549	Shapiro Wilk Test Statistic	0.916
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
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	78.25	95% H-UCL	82.39
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	90.31
95% Adjusted-CLT UCL	91.07	97.5% Chebyshev (MVUE) UCL	110.8
95% Modified-t UCL	80.5	99% Chebyshev (MVUE) UCL	151.1
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.899	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	53.82		
nu star	32.37		
Approximate Chi Square Value (.05)	20.36	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	76.62
Adjusted Chi Square Value	19.45	95% Jackknife UCL	78.25
		95% Standard Bootstrap UCL	75.34
Anderson-Darling Test Statistic	1.066	95% Bootstrap-t UCL	129.2
Anderson-Darling 5% Critical Value	0.766	95% Hall's Bootstrap UCL	181.3
Kolmogorov-Smirnov Test Statistic	0.205	95% Percentile Bootstrap UCL	78.38
Kolmogorov-Smirnov 5% Critical Value	0.209	95% BCA Bootstrap UCL	94.91
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	123.2
		97.5% Chebyshev(Mean, Sd) UCL	155.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	219.1
95% Approximate Gamma UCL	76.92		
95% Adjusted Gamma UCL	80.52		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**76.92**

U-235 SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-235 SWMU 7 Surface

General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	0.274	Minimum of Log Data	-1.295
Maximum	6.03	Maximum of Log Data	1.797
Mean	2.667	Mean of log Data	0.645
Median	1.815	SD of log Data	0.959
SD	1.904		
Coefficient of Variation	0.714		
Skewness	0.487		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.909	Shapiro Wilk Test Statistic	0.903
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	3.501	95% H-UCL	5.813
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	6.215
95% Adjusted-CLT UCL	3.511	97.5% Chebyshev (MVUE) UCL	7.648
95% Modified-t UCL	3.511	99% Chebyshev (MVUE) UCL	10.46
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.37	Data appear Normal at 5% Significance Level	
Theta Star	1.947		
nu star	43.83		
Approximate Chi Square Value (.05)	29.65	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	3.449
Adjusted Chi Square Value	28.32	95% Jackknife UCL	3.501
		95% Standard Bootstrap UCL	3.44
Anderson-Darling Test Statistic	0.402	95% Bootstrap-t UCL	3.589
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	3.466
Kolmogorov-Smirnov Test Statistic	0.135	95% Percentile Bootstrap UCL	3.436
Kolmogorov-Smirnov 5% Critical Value	0.219	95% BCA Bootstrap UCL	3.505
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	4.741
		97.5% Chebyshev(Mean, Sd) UCL	5.639
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	7.402
95% Approximate Gamma UCL	3.942		
95% Adjusted Gamma UCL	4.127		
Potential UCL to Use		**Use 95% Student's-t UCL**	**3.501**

U-238 SWMU 7 Surface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-238 SWMU 7 Surface

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	17	Minimum of Log Data	2.833
Maximum	2390	Maximum of Log Data	7.779
Mean	251.6	Mean of log Data	4.507
Median	62.7	SD of log Data	1.28
SD	554.1		
Coefficient of Variation	2.202		
Skewness	3.781		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.44	Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
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	478.8	95% H-UCL	536.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	479.6
95% Adjusted-CLT UCL	590.8	97.5% Chebyshev (MVUE) UCL	604.5
95% Modified-t UCL	498.2	99% Chebyshev (MVUE) UCL	849.9
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.541	Data appear Lognormal at 5% Significance Level	
Theta Star	465.1		
nu star	19.47		
Approximate Chi Square Value (.05)	10.46	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	466.4
Adjusted Chi Square Value	9.833	95% Jackknife UCL	478.8
		95% Standard Bootstrap UCL	464.1
Anderson-Darling Test Statistic	1.504	95% Bootstrap-t UCL	1250
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	1179
Kolmogorov-Smirnov Test Statistic	0.265	95% Percentile Bootstrap UCL	508.4
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	601.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	820.9
		97.5% Chebyshev(Mean, Sd) UCL	1067
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1551
95% Approximate Gamma UCL	468.2		
95% Adjusted Gamma UCL	498.2		

Potential UCL to Use		**Use 95% Chebyshev (MVUE) UCL**	**479.6**

SWMU 7 SUBSURFACE SAMPLES

Aluminum SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum SWMU 7 Subsurface

General Statistics

Number of Valid Samples	37	Number of Detected Data	33
Number of Unique Samples	29	Number of Non-Detect Data	4
		Percent Non-Detects	10.81%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	2900	Minimum Detected	7.972
Maximum Detected	16000	Maximum Detected	9.68
Mean of Detected	8300	Mean of Detected	8.969
SD of Detected	2673	SD of Detected	0.351
Minimum Non-Detect	8030	Minimum Non-Detect	8.991
Maximum Non-Detect	9010	Maximum Non-Detect	9.106
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	26
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	70.27%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.96	Shapiro Wilk Test Statistic	0.943
5% Shapiro Wilk Critical Value	0.931	5% Shapiro Wilk Critical Value	0.931
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	7864	Mean	8.903
SD	2823	SD	0.384
95% DL/2 (t) UCL	8647	95% H-Stat (DL/2) UCL	8946
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	7112	Mean in Log Scale	8.945
SD	3414	SD in Log Scale	0.339
95% MLE (t) UCL	8059	Mean in Original Scale	8082
95% MLE (Tiku) UCL	8782	SD in Original Scale	2601
		95% Percentile Bootstrap UCL	8812
		95% BCA Bootstrap UCL	8813
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	8.434	Data appear Normal at 5% Significance Level	
Theta Star	984.1		
nu star	556.6		
A-D Test Statistic	0.533	Nonparametric Statistics	
5% A-D Critical Value	0.747	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.747	Mean	8102
5% K-S Critical Value	0.153	SD	2607
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	445.7
		95% KM (t) UCL	8854
Assuming Gamma Distribution		95% KM (z) UCL	8835
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	8855

Minimum	2900	95% KM (bootstrap t) UCL	8898
Maximum	16000	95% KM (BCA) UCL	8805
Mean	8208	95% KM (Percentile Bootstrap) UCL	8886
Median	8041	95% KM (Chebyshev) UCL	10045
SD	2539	97.5% KM (Chebyshev) UCL	10885
k star	9.393	99% KM (Chebyshev) UCL	12537
Theta star	873.8		
Nu star	695.1	Potential UCLs to Use	
AppChi2	634.9	95% KM (t) UCL	8854
95% Gamma Approximate UCL	8986	**95% KM (Percentile Bootstrap) UCL**	**8886**
95% Adjusted Gamma UCL	9022		

Note: DL/2 is not a recommended method.

Iron SWMU 7 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Iron SWMU 7 Subsurface			
General Statistics			
Number of Valid Samples	37	Number of Unique Samples	30
Raw Statistics		Log-transformed Statistics	
Minimum	6100	Minimum of Log Data	8.716
Maximum	30000	Maximum of Log Data	10.31
Mean	13342	Mean of log Data	9.422
Median	12300	SD of log Data	0.386
SD	5710		
Coefficient of Variation	0.428		
Skewness	1.438		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.857	Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
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	14926	95% H-UCL	14983
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	17065
95% Adjusted-CLT UCL	15123	97.5% Chebyshev (MVUE) UCL	18700
95% Modified-t UCL	14963	99% Chebyshev (MVUE) UCL	21910
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	6.196	Data appear Lognormal at 5% Significance Level	
Theta Star	2153		
nu star	458.5		
Approximate Chi Square Value (.05)	409.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	14886
Adjusted Chi Square Value	407.8	95% Jackknife UCL	14926
		95% Standard Bootstrap UCL	14859
Anderson-Darling Test Statistic	0.787	95% Bootstrap-t UCL	15221
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	15157
Kolmogorov-Smirnov Test Statistic	0.183	95% Percentile Bootstrap UCL	14822
Kolmogorov-Smirnov 5% Critical Value	0.145	95% BCA Bootstrap UCL	15067
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	17433
		97.5% Chebyshev(Mean, Sd) UCL	19204
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	22681
95% Approximate Gamma UCL	14925		
95% Adjusted Gamma UCL	14998		
Potential UCL to Use		**Use 95% Student's-t UCL**	**14926**
		or 95% Modified-t UCL	14963
		or 95% H-UCL	14983

Lead SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Lead SWMU 7 Subsurface			
General Statistics			
Number of Valid Samples	37	Number of Detected Data	33
Number of Unique Samples	30	Number of Non-Detect Data	4
		Percent Non-Detects	10.81%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	4.7	Minimum Detected	1.548
Maximum Detected	120	Maximum Detected	4.787
Mean of Detected	14.99	Mean of Detected	2.396
SD of Detected	20.01	SD of Detected	0.666
Minimum Non-Detect	5.06	Minimum Non-Detect	1.621
Maximum Non-Detect	11	Maximum Non-Detect	2.398
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	24
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	13
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	64.86%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.442	Shapiro Wilk Test Statistic	0.872
5% Shapiro Wilk Critical Value	0.931	5% Shapiro Wilk Critical Value	0.931
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	13.82	Mean	2.289
SD	19.17	SD	0.708
95% DL/2 (t) UCL	19.14	95% H-Stat (DL/2) UCL	15.52
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.325
		SD in Log Scale	0.67
		Mean in Original Scale	14.02
		SD in Original Scale	19.08
		95% Percentile Bootstrap UCL	19.77
		95% BCA Bootstrap UCL	23.59
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.614	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.283		
nu star	106.5		
A-D Test Statistic	2.349	Nonparametric Statistics	
5% A-D Critical Value	0.762	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.762	Mean	14.05
5% K-S Critical Value	0.156	SD	18.81
Data not Gamma Distributed at 5% Significance Level		SE of Mean	3.141
		95% KM (t) UCL	19.35
Assuming Gamma Distribution		95% KM (z) UCL	19.22
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	19.34
Minimum	0	95% KM (bootstrap t) UCL	28.37
Maximum	120	95% KM (BCA) UCL	20.2
Mean	14.11	95% KM (Percentile Bootstrap) UCL	19.76

Median	9.1	95% KM (Chebyshev) UCL	27.74
SD	19.1	97.5% KM (Chebyshev) UCL	33.66
k star	0.641	99% KM (Chebyshev) UCL	45.3
Theta star	22.02		
Nu star	47.41	Potential UCLs to Use	
AppChi2	32.61	**95% KM (Chebyshev) UCL**	**27.74**
95% Gamma Approximate UCL	20.51		
95% Adjusted Gamma UCL	20.85		
Note: DL/2 is not a recommended method.			

Manganese SWMU 7 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Manganese SWMU 7 Subsurface			
General Statistics			
Number of Valid Samples	37	Number of Unique Samples	30
Raw Statistics		Log-transformed Statistics	
Minimum	104	Minimum of Log Data	4.644
Maximum	1200	Maximum of Log Data	7.09
Mean	330.2	Mean of log Data	5.619
Median	277	SD of log Data	0.577
SD	237		
Coefficient of Variation	0.718		
Skewness	2.18		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.757	Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
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	396	95% H-UCL	393.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	466.4
95% Adjusted-CLT UCL	409.3	97.5% Chebyshev (MVUE) UCL	528
95% Modified-t UCL	398.4	99% Chebyshev (MVUE) UCL	649
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.707	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	122		
nu star	200.3		
Approximate Chi Square Value (.05)	168.6	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	394.3
Adjusted Chi Square Value	167.3	95% Jackknife UCL	396
		95% Standard Bootstrap UCL	394.6
Anderson-Darling Test Statistic	1.022	95% Bootstrap-t UCL	425.5
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	419.3
Kolmogorov-Smirnov Test Statistic	0.126	95% Percentile Bootstrap UCL	398.4
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	405.4
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	500.1
		97.5% Chebyshev(Mean, Sd) UCL	573.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	717.9
95% Approximate Gamma UCL	392.4		
95% Adjusted Gamma UCL	395.4		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**392.4**

Uranium Metal SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Uranium Metal SWMU 7 Subsurface

General Statistics

Number of Valid Samples	39	Number of Detected Data	15
Number of Unique Samples	14	Number of Non-Detect Data	24
		Percent Non-Detects	61.54%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	1.08	Minimum Detected	0.077
Maximum Detected	1170	Maximum Detected	7.065
Mean of Detected	218.8	Mean of Detected	4.483
SD of Detected	291.1	SD of Detected	1.849
Minimum Non-Detect	0.911	Minimum Non-Detect	-0.0932
Maximum Non-Detect	1270	Maximum Non-Detect	7.147

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	39
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	0
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	100.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.666	Shapiro Wilk Test Statistic	0.845
5% Shapiro Wilk Critical Value	0.881	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	103.8	Mean	2.294
SD	223	SD	2.537
95% DL/2 (t) UCL	164.1	95% H-Stat (DL/2) UCL	350.1

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	1.805
		SD in Log Scale	2.465
		Mean in Original Scale	85.02
		SD in Original Scale	206.6
		95% Percentile Bootstrap UCL	144.3
		95% BCA Bootstrap UCL	167.7

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.582	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	376		
nu star	17.46		
A-D Test Statistic	0.407	Nonparametric Statistics	
5% A-D Critical Value	0.781	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.781	Mean	87.41
5% K-S Critical Value	0.231	SD	206.2
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	34.63
		95% KM (t) UCL	145.8
Assuming Gamma Distribution		95% KM (z) UCL	144.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	144
Minimum	1.08	95% KM (bootstrap t) UCL	203.7
Maximum	1170	95% KM (BCA) UCL	177.2
Mean	212.8	95% KM (Percentile Bootstrap) UCL	155.9

Median	188.9	95% KM (Chebyshev) UCL	238.3
SD	178.9	97.5% KM (Chebyshev) UCL	303.7
k star	1.449	99% KM (Chebyshev) UCL	432
Theta star	146.9		
Nu star	113	Potential UCLs to Use	
AppChi2	89.48	**95% KM (t) UCL**	**145.8**
95% Gamma Approximate UCL	268.8		
95% Adjusted Gamma UCL	271.3		
Note: DL/2 is not a recommended method.			

Vanadium SWMU 7 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Vanadium SWMU 7 Subsurface			
General Statistics			
Number of Valid Samples	37	Number of Unique Samples	29
Raw Statistics		Log-transformed Statistics	
Minimum	2.34	Minimum of Log Data	0.85
Maximum	52	Maximum of Log Data	3.951
Mean	19.28	Mean of log Data	2.782
Median	20	SD of log Data	0.671
SD	10.16		
Coefficient of Variation	0.527		
Skewness	0.621		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.936	Shapiro Wilk Test Statistic	0.897
Shapiro Wilk Critical Value	0.936	Shapiro Wilk Critical Value	0.936
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	22.1	95% H-UCL	25.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	30.52
95% Adjusted-CLT UCL	22.21	97.5% Chebyshev (MVUE) UCL	35.04
95% Modified-t UCL	22.13	99% Chebyshev (MVUE) UCL	43.92
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.754	Data appear Normal at 5% Significance Level	
Theta Star	7.001		
nu star	203.8		
Approximate Chi Square Value (.05)	171.8	Nonparametric Statistics	
Adjusted Level of Significance	0.0431	95% CLT UCL	22.03
Adjusted Chi Square Value	170.5	95% Jackknife UCL	22.1
		95% Standard Bootstrap UCL	21.95
Anderson-Darling Test Statistic	1.256	95% Bootstrap-t UCL	22.35
Anderson-Darling 5% Critical Value	0.754	95% Hall's Bootstrap UCL	22.55
Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL	22.14
Kolmogorov-Smirnov 5% Critical Value	0.146	95% BCA Bootstrap UCL	22.16
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	26.56
		97.5% Chebyshev(Mean, Sd) UCL	29.72
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	35.91
95% Approximate Gamma UCL	22.88		
95% Adjusted Gamma UCL	23.05		
Potential UCL to Use		**Use 95% Student's-t UCL**	**22.1**

PCB-1260 SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

PCB-1260 SWMU 7 Subsurface

General Statistics			
Number of Valid Samples	40	Number of Detected Data	12
Number of Unique Samples	12	Number of Non-Detect Data	28
		Percent Non-Detects	70.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.051	Minimum Detected	-2.976
Maximum Detected	2450	Maximum Detected	7.804
Mean of Detected	204.8	Mean of Detected	-0.297
SD of Detected	707	SD of Detected	2.822
Minimum Non-Detect	8.40E-04	Minimum Non-Detect	-7.082
Maximum Non-Detect	950	Maximum Non-Detect	6.856
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	39
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	1
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	97.50%

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.328	Shapiro Wilk Test Statistic	0.738
5% Shapiro Wilk Critical Value	0.859	5% Shapiro Wilk Critical Value	0.859
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	91.58	Mean	-0.485
SD	389.9	SD	4.868
95% DL/2 (t) UCL	195.4	95% H-Stat (DL/2) UCL	80060550
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	-3.773
		SD in Log Scale	3.706
		Mean in Original Scale	61.61
		SD in Original Scale	387.3
		95% Percentile Bootstrap UCL	184.1
		95% BCA Bootstrap UCL	245.7
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.159	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1286		
nu star	3.824		
A-D Test Statistic	2.924	Nonparametric Statistics	
5% A-D Critical Value	0.886	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.886	Mean	61.62
5% K-S Critical Value	0.274	SD	382.4
Data not Gamma Distributed at 5% Significance Level		SE of Mean	63.16
		95% KM (t) UCL	168
Assuming Gamma Distribution		95% KM (z) UCL	165.5
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	164.8
Minimum	0	95% KM (bootstrap t) UCL	50564
Maximum	32282	95% KM (BCA) UCL	184.2
Mean	2135	95% KM (Percentile Bootstrap) UCL	184.1

Median	0.35	95% KM (Chebyshev) UCL	336.9
SD	6152	97.5% KM (Chebyshev) UCL	456
k star	0.0794	99% KM (Chebyshev) UCL	690
Theta star	26897		
Nu star	6.351	Potential UCLs to Use	
AppChi2	1.822	**99% KM (Chebyshev) UCL**	**690**
95% Gamma Approximate UCL	7444		
95% Adjusted Gamma UCL	7827	**95% UCL exceeds maximum detected so maximum detected value of 2.45 will be used**	
Note: DL/2 is not a recommended method.			

Tc-99 SWMU Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From	
File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Tc-99 SWMU Subsurface

General Statistics

Number of Valid Samples	40	Number of Detected Data	30
Number of Unique Samples	30	Number of Non-Detect Data	10
		Percent Non-Detects	25.00%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	-0.154	Log Statistics Not Available	
Maximum Detected	406		
Mean of Detected	27.96		
Mean of Detected	27.96		
Mean of Detected	27.96		
Maximum Non-Detect	1.68		
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	21
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	19
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	52.50%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.4	Not Available	
5% Shapiro Wilk Critical Value	0.927		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	21.09		
SD	68.25		
95% DL/2 (t) UCL	39.27		
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	-30.33		
SD	108.2		
95% MLE (t) UCL	-1.521		
95% MLE (Tiku) UCL	7.251		
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
Gamma Statistics Not Available		Data do not follow a Discernable Distribution (0.05)	

Potential UCLs to Use

99% KM (Chebyshev) UCL **128.9**

Nonparametric Statistics

Kaplan-Meier (KM) Method

Mean	21
SD	67.41
SE of Mean	10.84
95% KM (t) UCL	39.27
95% KM (z) UCL	38.84
95% KM (jackknife) UCL	39.19
95% KM (bootstrap t) UCL	81.05
95% KM (BCA) UCL	45
95% KM (Percentile Bootstrap) UCL	41.23
95% KM (Chebyshev) UCL	68.26
97.5% KM (Chebyshev) UCL	88.71
99% KM (Chebyshev) UCL	128.9

Note: DL/2 is not a recommended method.

Th-228 SWMU 7 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Th-228 SWMU 7 Subsurface			
General Statistics			
Number of Valid Samples	21	Number of Unique Samples	20
Raw Statistics		Log-transformed Statistics	
Minimum	0.326	Minimum of Log Data	-1.121
Maximum	3.36	Maximum of Log Data	1.212
Mean	0.706	Mean of log Data	-0.563
Median	0.491	SD of log Data	0.572
SD	0.676		
Coefficient of Variation	0.958		
Skewness	3.38		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.535	Shapiro Wilk Test Statistic	0.787
Shapiro Wilk Critical Value	0.908	Shapiro Wilk Critical Value	0.908
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	0.96	95% H-UCL	0.872
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.044
95% Adjusted-CLT UCL	1.065	97.5% Chebyshev (MVUE) UCL	1.208
95% Modified-t UCL	0.978	99% Chebyshev (MVUE) UCL	1.53
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	2.162	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.326		
nu star	90.79		
Approximate Chi Square Value (.05)	69.82	Nonparametric Statistics	
Adjusted Level of Significance	0.0383	95% CLT UCL	0.948
Adjusted Chi Square Value	68.4	95% Jackknife UCL	0.96
		95% Standard Bootstrap UCL	0.942
Anderson-Darling Test Statistic	2.295	95% Bootstrap-t UCL	1.369
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	1.741
Kolmogorov-Smirnov Test Statistic	0.314	95% Percentile Bootstrap UCL	0.99
Kolmogorov-Smirnov 5% Critical Value	0.191	95% BCA Bootstrap UCL	1.105
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.349
		97.5% Chebyshev(Mean, Sd) UCL	1.627
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.174
95% Approximate Gamma UCL	0.918		
95% Adjusted Gamma UCL	0.937		
Potential UCL to Use		**Use 95% Chebyshev (Mean, Sd) UCL**	**1.349**

Th-230 SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Th-230 SWMU 7 Subsurface

General Statistics			
Number of Valid Samples	39	Number of Detected Data	37
Number of Unique Samples	34	Number of Non-Detect Data	2
		Percent Non-Detects	5.13%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.294	Minimum Detected	-1.224
Maximum Detected	3.94	Maximum Detected	1.371
Mean of Detected	1.355	Mean of Detected	0.0573
SD of Detected	0.954	SD of Detected	0.734
Minimum Non-Detect	0.227	Minimum Non-Detect	-1.483
Maximum Non-Detect	0.23	Maximum Non-Detect	-1.47
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	2
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	37
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	5.13%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.941
5% Shapiro Wilk Critical Value	0.936	5% Shapiro Wilk Critical Value	0.936
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.291	Mean	-0.0569
SD	0.969	SD	0.87
95% DL/2 (t) UCL	1.553	95% H-Stat (DL/2) UCL	1.606
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.271	Mean in Log Scale	-0.0319
SD	0.99	SD in Log Scale	0.813
95% MLE (t) UCL	1.538	Mean in Original Scale	1.295
95% MLE (Tiku) UCL	1.529	SD in Original Scale	0.965
		95% Percentile Bootstrap UCL	1.556
		95% BCA Bootstrap UCL	1.588
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.024	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.669		
nu star	149.8		
A-D Test Statistic	0.583	Nonparametric Statistics	
5% A-D Critical Value	0.758	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.758	Mean	1.3
5% K-S Critical Value	0.147	SD	0.946
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.154
		95% KM (t) UCL	1.559
Assuming Gamma Distribution		95% KM (z) UCL	1.553
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.557
Minimum	0	95% KM (bootstrap t) UCL	1.613
Maximum	3.94	95% KM (BCA) UCL	1.572
Mean	1.285	95% KM (Percentile Bootstrap) UCL	1.552

Median	1.19	95% KM (Chebyshev) UCL	1.97
SD	0.977	97.5% KM (Chebyshev) UCL	2.259
k star	0.482	99% KM (Chebyshev) UCL	2.828
Theta star	2.665		
Nu star	37.61	Potential UCLs to Use	
AppChi2	24.57	**95% KM (BCA) UCL**	**1.572**
95% Gamma Approximate UCL	1.967		
95% Adjusted Gamma UCL	2.001		

U-234 SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From	
File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-234 SWMU 7 Subsurface

General Statistics

Number of Valid Samples	50	Number of Detected Data	46
Number of Unique Samples	46	Number of Non-Detect Data	4
		Percent Non-Detects	8.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.142	Minimum Detected	-1.952
Maximum Detected	318	Maximum Detected	5.762
Mean of Detected	26.02	Mean of Detected	1.626
SD of Detected	53.22	SD of Detected	2.101
Minimum Non-Detect	0.0519	Minimum Non-Detect	-2.958
Maximum Non-Detect	0.134	Maximum Non-Detect	-2.01

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	4
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	46
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	8.00%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.524	Shapiro Wilk Test Statistic	0.948
5% Shapiro Wilk Critical Value	0.945	5% Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	23.94	Mean	1.258
SD	51.5	SD	2.377
95% DL/2 (t) UCL	36.15	95% H-Stat (DL/2) UCL	130.6

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	21.05	Mean in Log Scale	1.244
SD	53.85	SD in Log Scale	2.4
95% MLE (t) UCL	33.82	Mean in Original Scale	23.94
95% MLE (Tiku) UCL	32.79	SD in Original Scale	51.5
		95% Percentile Bootstrap UCL	37.89
		95% BCA Bootstrap UCL	41.65

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data Follow Appr. Gamma Distribution at 5% Significance Level	
k star (bias corrected)	0.391		
Theta Star	66.57		
nu star	35.95		
A-D Test Statistic	0.93	Nonparametric Statistics	
5% A-D Critical Value	0.837	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.837	Mean	23.95
5% K-S Critical Value	0.14	SD	50.98
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	7.289

		95% KM (t) UCL	36.17
Assuming Gamma Distribution		95% KM (z) UCL	35.93
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	36.15
Minimu			
m	0	95% KM (bootstrap t) UCL	47.31
Maximu			
m	318	95% KM (BCA) UCL	36.61
Mean	23.93	95% KM (Percentile Bootstrap) UCL	36.58
Median	5.02	95% KM (Chebyshev) UCL	55.72
SD	51.5	97.5% KM (Chebyshev) UCL	69.47
k star	0.218	99% KM (Chebyshev) UCL	96.47
Theta			
star	109.9		
Nu star	21.79	**Potential UCLs to Use**	
AppChi2	12.18	**95% KM (Chebyshev) UCL**	**55.72**
95% Gamma Approximate UCL	42.82		
95% Adjusted Gamma UCL	43.58		
Note: DL/2 is not a recommended method.			

U-235 SWMU 7 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From	
File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-235 SWMU 7 Subsurface

General Statistics

Number of Valid Samples	45	Number of Detected Data	34
Number of Unique Samples	33	Number of Non-Detect Data	11
			24.44
		Percent Non-Detects	%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.0509	Log Statistics Not Available	
Maximum Detected	42.1		
Mean of Detected	2.774		
Mean of Detected	2.774		
Mean of Detected	2.774		
Maximum Non-Detect	0.0197		
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	34
			24.44
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.36	Not Available	
5% Shapiro Wilk Critical Value	0.933		
Data not Normal at 5% Significance Level			

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	2.098		
SD	6.324		
95% DL/2 (t) UCL	3.681		
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	0.706		
SD	7.455		
95% MLE (t) UCL	2.574		
95% MLE (Tiku) UCL	2.575		

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data Follow Appr. Gamma Distribution at 5%	
Gamma Statistics Not Available		Significance Level	

Potential UCLs to Use		Nonparametric Statistics	
95% KM (Percentile Bootstrap) UCL	**3.822**	Kaplan-Meier (KM) Method	
		Mean	2.109
		SD	6.249
		SE of Mean	0.946
		95% KM (t) UCL	3.697
		95% KM (z) UCL	3.664
		95% KM (jackknife) UCL	3.689
		95% KM (bootstrap t) UCL	7.396
		95% KM (BCA) UCL	3.988

	95% KM (Percentile Bootstrap) UCL	3.822
	95% KM (Chebyshev) UCL	6.23
	97.5% KM (Chebyshev) UCL	8.014
	99% KM (Chebyshev) UCL	11.52

Note: DL/2 is not a recommended method.

U-238 SWMU 7 Subsurface

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

U-238 SWMU 7 Subsurface

General Statistics			
Number of Valid Samples	50	Number of Detected Data	45
Number of Unique Samples	45	Number of Non-Detect Data	5
		Percent Non-Detects	10.00%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.147	Minimum Detected	-1.917
Maximum Detected	2390	Maximum Detected	7.779
Mean of Detected	111.7	Mean of Detected	2.548
SD of Detected	364.6	SD of Detected	2.304
Minimum Non-Detect	0.0777	Minimum Non-Detect	-2.555
Maximum Non-Detect	0.123	Maximum Non-Detect	-2.096

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	45
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	10.00%

UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.321	Shapiro Wilk Test Statistic	0.972
5% Shapiro Wilk Critical Value	0.945	5% Shapiro Wilk Critical Value	0.945
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	100.6	Mean	1.992
SD	347.1	SD	2.758
95% DL/2 (t) UCL	182.9	95% H-Stat (DL/2) UCL	858.8
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	73.88	Mean in Log Scale	2.031
SD	366.3	SD in Log Scale	2.688
95% MLE (t) UCL	160.7	Mean in Original Scale	100.6
95% MLE (Tiku) UCL	153.7	SD in Original Scale	347.1
		95% Percentile Bootstrap UCL	190.8
		95% BCA Bootstrap UCL	264.8
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.309	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	361.3		
nu star	27.83		
A-D Test Statistic	1.62	Nonparametric Statistics	
5% A-D Critical Value	0.858	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.858	Mean	100.6
5% K-S Critical Value	0.143	SD	343.6
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	49.14
		95% KM (t) UCL	183
Assuming Gamma Distribution		95% KM (z) UCL	181.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	182.9
Minimum	0	95% KM (bootstrap t) UCL	434.1
Maximum	2390	95% KM (BCA) UCL	201.9
Mean	100.6	95% KM (Percentile Bootstrap) UCL	190.2

Median	11.55	95% KM (Chebyshev) UCL	314.8
SD	347.1	97.5% KM (Chebyshev) UCL	407.5
k star	0.175	99% KM (Chebyshev) UCL	589.6
Theta star	575.8		
Nu star	17.47	**Potential UCLs to Use**	
AppChi2	9.006	**95% KM (Chebyshev) UCL**	**314.8**
95% Gamma Approximate UCL	195		
95% Adjusted Gamma UCL	199		

Note: DL/2 is not a recommended method.

SWMU 30 SURFACE SAMPLES

Nickel SWMU 30 Surface

	General UCL Statistics for Full Data Sets			
User Selected Options				
From File	WorkSheet.wst			
Full Precision	OFF			
Confidence				
Coefficient	95%			
Number of Bootstrap Operations	2000			
Nickel SWMU 30 Surface				
General Statistics				
Number of Valid Samples	10	Number of Unique Samples		9
Raw Statistics		Log-transformed Statistics		
Minimum	13.2	Minimum of Log Data		2.58
Maximum	570	Maximum of Log Data		6.346
Mean	114.2	Mean of log Data		3.612
Median	21	SD of log Data		1.381
SD	201.7			
Coefficient of Variation	1.766			
Skewness	1.927			
Relevant UCL Statistics				
Normal Distribution Test		Lognormal Distribution Test		
Shapiro Wilk Test Statistic	0.563	Shapiro Wilk Test Statistic		0.688
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	231.1	95% H-UCL		586.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL		248.4
95% Adjusted-CLT UCL	260.7	97.5% Chebyshev (MVUE) UCL		320.2
95% Modified-t UCL	237.6	99% Chebyshev (MVUE) UCL		461.3
Gamma Distribution Test		Data Distribution		
k star (bias corrected)	0.455	Data do not follow a Discernable Distribution (0.05)		
Theta Star	250.9			
nu star	9.105			
Approximate Chi Square Value (.05)	3.39	Nonparametric Statistics		
Adjusted Level of Significance	0.0267	95% CLT UCL		219.1
Adjusted Chi Square Value	2.812	95% Jackknife UCL		231.1
		95% Standard Bootstrap UCL		213.5
Anderson-Darling Test Statistic	1.904	95% Bootstrap-t UCL		3455
Anderson-Darling 5% Critical Value	0.773	95% Hall's Bootstrap UCL		1899
Kolmogorov-Smirnov Test Statistic	0.427	95% Percentile Bootstrap UCL		211.1
Kolmogorov-Smirnov 5% Critical Value	0.28	95% BCA Bootstrap UCL		261.9
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL		392.2
		97.5% Chebyshev(Mean, Sd) UCL		512.5
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL		748.8
95% Approximate Gamma UCL	306.7			
95% Adjusted Gamma UCL	369.7			
Potential UCL to Use		**Use 99% Chebyshev (Mean, Sd) UCL**		**748.8**
Recommended UCL exceeds the maximum observation				

SWMU 30 SUBSURFACE SAMPLES

Aluminum SWMU 30 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Aluminum SWMU 30 Subsurface			
General Statistics			
Number of Valid Samples	16	Number of Unique Samples	15
Raw Statistics		Log-transformed Statistics	
Minimum	7430	Minimum of Log Data	8.913
Maximum	19000	Maximum of Log Data	9.852
Mean	11284	Mean of log Data	9.289
Median	9700	SD of log Data	0.292
SD	3517		
Coefficient of Variation	0.312		
Skewness	0.934		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.878	Shapiro Wilk Test Statistic	0.917
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	12825	95% H-UCL	13002
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	14888
95% Adjusted-CLT UCL	12949	97.5% Chebyshev (MVUE) UCL	16456
95% Modified-t UCL	12859	99% Chebyshev (MVUE) UCL	19537
Gamma Distribution Test		Data Distribution	
		Data appear Gamma Distributed at 5% Significance	
k star (bias corrected)	9.923	Level	
Theta Star	1137		
nu star	317.5		
Approximate Chi Square Value (.05)	277.3	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	12730
Adjusted Chi Square Value	273	95% Jackknife UCL	12825
		95% Standard Bootstrap UCL	12627
Anderson-Darling Test Statistic	0.674	95% Bootstrap-t UCL	13210
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	12879
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	12753
Kolmogorov-Smirnov 5% Critical Value	0.215	95% BCA Bootstrap UCL	12916
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15116
		97.5% Chebyshev(Mean, Sd) UCL	16775
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20032
95% Approximate Gamma UCL	12923		
95% Adjusted Gamma UCL	13126		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**12923**

Iron SWMU 30 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	C:\aaa\Swmu 30 Metals.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Iron SWMU 30 Subsurface			
General Statistics			
Number of Valid Samples	16	Number of Unique Samples	14
Raw Statistics		Log-transformed Statistics	
Minimum	5940	Minimum of Log Data	8.689
Maximum	29000	Maximum of Log Data	10.28
Mean	16650	Mean of log Data	9.648
Median	16000	SD of log Data	0.412
SD	6126		
Coefficient of Variation	0.368		
Skewness	0.196		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.985	Shapiro Wilk Test Statistic	0.955
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	19335	95% H-UCL	20790
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	24461
95% Adjusted-CLT UCL	19249	97.5% Chebyshev (MVUE) UCL	27792
95% Modified-t UCL	19347	99% Chebyshev (MVUE) UCL	34334
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	5.776	Data appear Normal at 5% Significance Level	
Theta Star	2883		
nu star	184.8		
Approximate Chi Square Value (.05)	154.4	Nonparametric Statistics	
Adjusted Level of Significance	0.0335	95% CLT UCL	19169
Adjusted Chi Square Value	151.2	95% Jackknife UCL	19335
		95% Standard Bootstrap UCL	19134
Anderson-Darling Test Statistic	0.205	95% Bootstrap-t UCL	19507
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	19483
Kolmogorov-Smirnov Test Statistic	0.12	95% Percentile Bootstrap UCL	19073
Kolmogorov-Smirnov 5% Critical Value	0.216	95% BCA Bootstrap UCL	19159
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23326
		97.5% Chebyshev(Mean, Sd) UCL	26215
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	31889
95% Approximate Gamma UCL	19934		
95% Adjusted Gamma UCL	20351		
Potential UCL to Use		**Use 95% Student's-t UCL**	**19335**

Lead SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	C:\aaa\Swmu 30 Metals.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead SWMU 30 Subsurface

General Statistics

Number of Valid Samples	18	Number of Detected Data	16
Number of Unique Samples	13	Number of Non-Detect Data	2
		Percent Non-Detects	11.11%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	3.15	Minimum Detected	1.147
Maximum Detected	71	Maximum Detected	4.263
Mean of Detected	22.34	Mean of Detected	2.744
SD of Detected	21.62	SD of Detected	0.868
Minimum Non-Detect	25	Minimum Non-Detect	3.219
Maximum Non-Detect	25	Maximum Non-Detect	3.219

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.719	Shapiro Wilk Test Statistic	0.942
5% Shapiro Wilk Critical Value	0.887	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.25	Mean	2.72
SD	20.56	SD	0.818
95% DL/2 (t) UCL	29.68	95% H-Stat (DL/2) UCL	40.11

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	2.717
		SD in Log Scale	0.827
		Mean in Original Scale	21.28
		SD in Original Scale	20.59
		95% Percentile Bootstrap UCL	29.38
		95% BCA Bootstrap UCL	31.05

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	1.281	Data appear Lognormal at 5% Significance Level	
Theta Star	17.44		
nu star	41.01		
A-D Test Statistic	0.808	Nonparametric Statistics	
5% A-D Critical Value	0.754	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.754	Mean	21.28
5% K-S Critical Value	0.219	SD	20.04
Data not Gamma Distributed at 5% Significance Level		SE of Mean	4.902
		95% KM (t) UCL	29.81
Assuming Gamma Distribution		95% KM (z) UCL	29.35
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	29.79
Minimum	3.15	95% KM (bootstrap t) UCL	36.34
Maximum	71	95% KM (BCA) UCL	29.97
Mean	22.24	95% KM (Percentile Bootstrap) UCL	29.91
Median	16	95% KM (Chebyshev) UCL	42.65
SD	20.43	97.5% KM (Chebyshev) UCL	51.9

k star	1.434	99% KM (Chebyshev) UCL	70.06
Theta star	15.52		
Nu star	51.61	**Potential UCLs to Use**	
AppChi2	36.11	**95% KM (Chebyshev) UCL**	**42.65**
95% Gamma Approximate UCL	31.79		
95% Adjusted Gamma UCL	32.92		

Nickel SWMU 30 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	C:\aaa\Swmu 30 Metals.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Nickel SWMU 30 Subsurface			
General Statistics			
Number of Valid Samples	18	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	9.35	Minimum of Log Data	2.235
Maximum	570	Maximum of Log Data	6.346
Mean	71.25	Mean of log Data	3.243
Median	17.9	SD of log Data	1.126
SD	154.9		
Coefficient of Variation	2.174		
Skewness	2.856		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.425	Shapiro Wilk Test Statistic	0.677
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	134.8	95% H-UCL	104.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	105.5
95% Adjusted-CLT UCL	157.6	97.5% Chebyshev (MVUE) UCL	131.4
95% Modified-t UCL	138.9	99% Chebyshev (MVUE) UCL	182.2
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	0.54	Data do not follow a Discernable Distribution (0.05)	
Theta Star	132		
nu star	19.43		
Approximate Chi Square Value (.05)	10.43	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	131.3
Adjusted Chi Square Value	9.802	95% Jackknife UCL	134.8
		95% Standard Bootstrap UCL	128.9
Anderson-Darling Test Statistic	3.725	95% Bootstrap-t UCL	1301
Anderson-Darling 5% Critical Value	0.791	95% Hall's Bootstrap UCL	612.9
Kolmogorov-Smirnov Test Statistic	0.428	95% Percentile Bootstrap UCL	132.5
Kolmogorov-Smirnov 5% Critical Value	0.214	95% BCA Bootstrap UCL	162.2
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	230.4
		97.5% Chebyshev(Mean, Sd) UCL	299.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	434.6
95% Approximate Gamma UCL	132.7		
95% Adjusted Gamma UCL	141.2		
Potential UCL to Use		**Use 99% Chebyshev (Mean, Sd) UCL**	**434.6**

Thallium SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	C:\aaa\Swmu 30 Metals.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Thallium SWMU 30 Subsurface

General Statistics

Number of Valid Samples	16	Number of Detected Data	15
Number of Unique Samples	12	Number of Non-Detect Data	1
		Percent Non-Detects	6.25%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	3.69	Minimum Detected	1.306
Maximum Detected	40	Maximum Detected	3.689
Mean of Detected	22.85	Mean of Detected	2.94
SD of Detected	10.93	SD of Detected	0.744
Minimum Non-Detect	2.27	Minimum Non-Detect	0.82
Maximum Non-Detect	2.27	Maximum Non-Detect	0.82

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Test Statistic	0.777
5% Shapiro Wilk Critical Value	0.881	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.49	Mean	2.764
SD	11.87	SD	1.006
95% DL/2 (t) UCL	26.7	95% H-Stat (DL/2) UCL	40.36

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	21.24	Mean in Log Scale	2.84
SD	12.02	SD in Log Scale	0.823
95% MLE (t) UCL	26.51	Mean in Original Scale	21.66
95% MLE (Tiku) UCL	26.55	SD in Original Scale	11.58
		95% Percentile Bootstrap UCL	26.17
		95% BCA Bootstrap UCL	25.95

Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.285	Data appear Normal at 5% Significance Level	
Theta Star	10		
nu star	68.55		
A-D Test Statistic	1.229	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.745	Mean	21.65
5% K-S Critical Value	0.223	SD	11.23
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.905
		95% KM (t) UCL	26.75
Assuming Gamma Distribution		95% KM (z) UCL	26.43
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.71
Minimum	0.375	95% KM (bootstrap t) UCL	26.21
Maximum	40	95% KM (BCA) UCL	26.34
Mean	21.45	95% KM (Percentile Bootstrap) UCL	26.38
Median	26	95% KM (Chebyshev) UCL	34.32
SD	11.96	97.5% KM (Chebyshev) UCL	39.8

k star	1.256	99% KM (Chebyshev) UCL	50.56
Theta star	17.08		
Nu star	40.18	**Potential UCLs to Use**	
AppChi2	26.65	**95% KM (t) UCL**	**26.75**
95% Gamma Approximate UCL	32.33	**95% KM (Percentile Bootstrap) UCL**	**26.38**
95% Adjusted Gamma UCL	33.92		

Vanadium SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Vanadium SWMU 30 Subsurface			
General Statistics			
Number of Valid Samples	16	Number of Detected Data	15
Number of Unique Samples	12	Number of Non-Detect Data	1
		Percent Non-Detects	6.25%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	3.69	Minimum Detected	1.306
Maximum Detected	40	Maximum Detected	3.689
Mean of Detected	22.85	Mean of Detected	2.94
SD of Detected	10.93	SD of Detected	0.744
Minimum Non-Detect	2.27	Minimum Non-Detect	0.82
Maximum Non-Detect	2.27	Maximum Non-Detect	0.82
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.914	Shapiro Wilk Test Statistic	0.777
5% Shapiro Wilk Critical Value	0.881	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	21.49	Mean	2.764
SD	11.87	SD	1.006
95% DL/2 (t) UCL	26.7	95% H-Stat (DL/2) UCL	40.36
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	21.24	Mean in Log Scale	2.84
SD	12.02	SD in Log Scale	0.823
95% MLE (t) UCL	26.51	Mean in Original Scale	21.66
95% MLE (Tiku) UCL	26.55	SD in Original Scale	11.58
		95% Percentile Bootstrap UCL	26.13
		95% BCA Bootstrap UCL	25.71
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	2.285	Data appear Normal at 5% Significance Level	
Theta Star	10		
nu star	68.55		
A-D Test Statistic	1.229	Nonparametric Statistics	
5% A-D Critical Value	0.745	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.745	Mean	21.65
5% K-S Critical Value	0.223	SD	11.23
Data not Gamma Distributed at 5% Significance Level		SE of Mean	2.905
		95% KM (t) UCL	26.75
Assuming Gamma Distribution		95% KM (z) UCL	26.43
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	26.71
Minimum	0.375	95% KM (bootstrap t) UCL	26.25
Maximum	40	95% KM (BCA) UCL	26.5
Mean	21.45	95% KM (Percentile Bootstrap) UCL	26.69
Median	26	95% KM (Chebyshev) UCL	34.32
SD	11.96	97.5% KM (Chebyshev) UCL	39.8

k star	1.256	99% KM (Chebyshev) UCL	50.56
Theta star	17.08		
Nu star	40.18	**Potential UCLs to Use**	
AppChi2	26.65	**95% KM (t) UCL**	**26.75**
95% Gamma Approximate UCL	32.33	**95% KM (Percentile Bootstrap) UCL**	**26.69**

PCB-1260 SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

PCB-1260 SWMU 30 Subsurface

General Statistics			
Number of Valid			
Samples	13	Number of Detected Data	12
Number of Unique Samples	10	Number of Non-Detect Data	1
		Percent Non-Detects	7.69%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.02	Minimum Detected	-3.912
Maximum Detected	15	Maximum Detected	2.708
Mean of Detected	1.834	Mean of Detected	-1.354
SD of Detected	4.248	SD of Detected	2.134
Minimum Non-Detect	8.40E-04	Minimum Non-Detect	-7.082
Maximum Non-Detect	8.40E-04	Maximum Non-Detect	-7.082
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.484	Shapiro Wilk Test Statistic	0.932
5% Shapiro Wilk Critical Value	0.859	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.693	Mean	-1.848
SD	4.099	SD	2.71
95% DL/2 (t) UCL	3.72	95% H-Stat (DL/2) UCL	242.8
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.476	Mean in Log Scale	-1.757
SD	4.148	SD in Log Scale	2.506
95% MLE (t) UCL	3.526	Mean in Original Scale	1.693
95% MLE (Tiku) UCL	3.353	SD in Original Scale	4.099
		95% Percentile Bootstrap UCL	3.883
		95% BCA Bootstrap UCL	4.912
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data appear Gamma Distributed at 5% Significance	
k star (bias corrected)	0.313	Level	
Theta Star	5.851		
nu star	7.524		
A-D Test Statistic	0.792	Nonparametric Statistics	
5% A-D Critical Value	0.815	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.815	Mean	1.695
5% K-S Critical Value	0.264	SD	3.938
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	1.141
		95% KM (t) UCL	3.728
Assuming Gamma Distribution		95% KM (z) UCL	3.571
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	3.72
Minimum	0	95% KM (bootstrap t) UCL	12.98
Maximum	15	95% KM (BCA) UCL	3.852
Mean	1.693	95% KM (Percentile Bootstrap) UCL	3.865
Median	0.18	95% KM (Chebyshev) UCL	6.667

SD	4.099	97.5% KM (Chebyshev) UCL	8.818
k star	0.217	99% KM (Chebyshev) UCL	13.04
Theta star	7.794		
Nu star	5.648	**Potential UCLs to Use**	
AppChi2	1.463	**95% KM (Chebyshev) UCL**	**6.667**
95% Gamma Approximate UCL	6.538		
95% Adjusted Gamma UCL	8.086		

Benzo(a)athracene SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Benzo(a)athracene SWMU 30 Subsurface

General Statistics			
Number of Valid Samples	17	Number of Detected Data	10
Number of Unique Samples	9	Number of Non-Detect Data	7
		Percent Non-Detects	41.18%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.017	Minimum Detected	-4.075
Maximum Detected	9.1	Maximum Detected	2.208
Mean of Detected	1.253	Mean of Detected	-1.742
SD of Detected	2.804	SD of Detected	2.17
Minimum Non-Detect	0.008	Minimum Non-Detect	-4.828
Maximum Non-Detect	0.49	Maximum Non-Detect	-0.713
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	14
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	82.35%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.502	Shapiro Wilk Test Statistic	0.9
5% Shapiro Wilk Critical Value	0.842	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.794	Mean	-2.321
SD	2.179	SD	2.213
95% DL/2 (t) UCL	1.717	95% H-Stat (DL/2) UCL	14.27
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	5.349	Mean in Log Scale	-3.098
SD	3.677	SD in Log Scale	2.54
95% MLE (t) UCL	6.905	Mean in Original Scale	0.744
95% MLE (Tiku) UCL	8.91	SD in Original Scale	2.194
		95% Percentile Bootstrap UCL	1.721
		95% BCA Bootstrap UCL	2.327
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data appear Gamma Distributed at 5% Significance	
k star (bias corrected)	0.307	Level	
Theta Star	4.085		
nu star	6.134		
A-D Test Statistic	0.765	Nonparametric Statistics	
5% A-D Critical Value	0.806	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.806	Mean	0.761
5% K-S Critical Value	0.286	SD	2.124
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.543
		95% KM (t) UCL	1.709
Assuming Gamma Distribution		95% KM (z) UCL	1.654
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.688

Minimum	0	95% KM (bootstrap t) UCL	5.242
Maximum	9.1	95% KM (BCA) UCL	1.809
Mean	0.862	95% KM (Percentile Bootstrap) UCL	1.776
Median	0.047	95% KM (Chebyshev) UCL	3.129
SD	2.19	97.5% KM (Chebyshev) UCL	4.154
k star	0.148	99% KM (Chebyshev) UCL	6.167
Theta star	5.807		
Nu star	5.045	**Potential UCLs to Use**	
		95% KM (BCA)	
AppChi2	1.173	**UCL**	**1.809**
95% Gamma Approximate UCL	3.706		
95% Adjusted Gamma UCL	4.383		

Tc-99 SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Tc-99 SWMU 30 Subsurface

General Statistics

Number of Valid Samples	17	Number of Detected Data	13
Number of Unique Samples	13	Number of Non-Detect Data	4
		Percent Non-Detects	23.53%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.101	Log Statistics Not Available	
Maximum Detected	360		
Mean of Detected	37.74		
Mean of Detected	37.74		
Mean of Detected	37.74		
Maximum Non-Detect	0.456		
Note: Data have multiple DLs – Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	47.06%

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.437	Not Available	
5% Shapiro Wilk Critical Value	0.866		
Data not Normal at 5% Significance Level			
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	N/A
Mean	28.82		
SD	89.33		
95% DL/2 (t) UCL	66.64		
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	N/A
Mean	-24.52		
SD	130.6		
95% MLE (t) UCL	30.78		
95% MLE (Tiku) UCL	42.69		
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
Gamma Statistics Not Available		Data appear Lognormal at 5% Significance Level	

Potential UCLs to Use		Nonparametric Statistics	
99% KM (Chebyshev) UCL	**246.5**	Kaplan-Meier (KM) Method	
		Mean	28.88
		SD	86.64
		SE of Mean	21.87
		95% KM (t) UCL	67.07
		95% KM (z) UCL	64.86
		95% KM (jackknife) UCL	66.7
		95% KM (bootstrap t) UCL	1291
		95% KM (BCA) UCL	70.55
		95% KM (Percentile Bootstrap) UCL	70.69
		95% KM (Chebyshev) UCL	124.2
		97.5% KM (Chebyshev) UCL	165.5
		99% KM (Chebyshev) UCL	246.5

Th-230 SWMU 30 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
Th-230 SWMU 30 Subsurface			
General Statistics			
Number of Valid Samples	17	Number of Unique Samples	16
Raw Statistics		Log-transformed Statistics	
Minimum	0.311	Minimum of Log Data	-1.168
Maximum	4.88	Maximum of Log Data	1.585
Mean	1.443	Mean of log Data	0.139
Median	1.35	SD of log Data	0.726
SD	1.053		
Coefficient of Variation	0.73		
Skewness	2.234		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.744	Shapiro Wilk Test Statistic	0.867
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	1.889	95% H-UCL	2.272
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	2.668
95% Adjusted-CLT UCL	2.011	97.5% Chebyshev (MVUE) UCL	3.187
95% Modified-t UCL	1.912	99% Chebyshev (MVUE) UCL	4.206
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.974	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.731		
nu star	67.13		
Approximate Chi Square Value (.05)	49.27	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	1.863
Adjusted Chi Square Value	47.67	95% Jackknife UCL	1.889
		95% Standard Bootstrap UCL	1.849
Anderson-Darling Test Statistic	1.061	95% Bootstrap-t UCL	2.145
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	4.162
Kolmogorov-Smirnov Test Statistic	0.249	95% Percentile Bootstrap UCL	1.898
Kolmogorov-Smirnov 5% Critical Value	0.211	95% BCA Bootstrap UCL	2.018
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	2.557
		97.5% Chebyshev(Mean, Sd) UCL	3.038
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.985
95% Approximate Gamma UCL	1.966		
95% Adjusted Gamma UCL	2.032		
Potential UCL to Use		**Use 95% Chebyshev (Mean, Sd) UCL**	**2.557**

U-234 SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		
U-234 SWMU 30 Subsurface			
General Statistics			
Number of Valid			
Samples	19	Number of Detected Data	17
Number of Unique Samples	17	Number of Non-Detect Data	2
		Percent Non-Detects	10.53%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.15	Minimum Detected	-1.897
Maximum Detected	115	Maximum Detected	4.745
Mean of Detected	30.07	Mean of Detected	2
SD of Detected	42.32	SD of Detected	2.077
Minimum Non-Detect	0.0707	Minimum Non-Detect	-2.649
Maximum Non-Detect	0.102	Maximum Non-Detect	-2.283
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	2
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	17
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	10.53%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.699	Shapiro Wilk Test Statistic	0.934
5% Shapiro Wilk Critical Value	0.892	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	26.91	Mean	1.457
SD	41.01	SD	2.546
95% DL/2 (t) UCL	43.22	95% H-Stat (DL/2) UCL	898.9
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	24.06	Mean in Log Scale	1.5
SD	43.19	SD in Log Scale	2.465
95% MLE (t) UCL	41.25	Mean in Original Scale	26.91
95% MLE (Tiku) UCL	40.33	SD in Original Scale	41.01
		95% Percentile Bootstrap UCL	42.32
		95% BCA Bootstrap UCL	44.11
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data appear Gamma Distributed at 5% Significance	
k star (bias corrected)	0.417	Level	
Theta Star	72.12		
nu star	14.17		
A-D Test Statistic	0.587	Nonparametric Statistics	
5% A-D Critical Value	0.807	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.807	Mean	26.92
5% K-S Critical Value	0.222	SD	39.91
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	9.437
		95% KM (t) UCL	43.28
Assuming Gamma Distribution		95% KM (z) UCL	42.44
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	43.22

Minimum	0	95% KM (bootstrap t) UCL	50.71
Maximum	115	95% KM (BCA) UCL	43.1
Mean	26.9	95% KM (Percentile Bootstrap) UCL	42.92
Median	6.33	95% KM (Chebyshev) UCL	68.05
SD	41.01	97.5% KM (Chebyshev) UCL	85.85
k star	0.203	99% KM (Chebyshev) UCL	120.8
Theta star	132.3		
Nu star	7.726	**Potential UCLs to Use**	
AppChi2	2.577	**95% KM (Chebyshev) UCL**	**68.05**
95% Gamma Approximate UCL	80.64		
95% Adjusted Gamma UCL	89.41		

U-235 SWMU 30 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-235 SWMU 30 Subsurface

General Statistics

Number of Valid Samples	13	Number of Unique Samples	13

Raw Statistics		Log-transformed Statistics	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	16.6	Maximum of Log Data	2.809
Mean	4.032	Mean of log Data	-0.00509
Median	0.55	SD of log Data	2.038
SD	5.583		
Coefficient of Variation	1.385		
Skewness	1.303		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.744	Shapiro Wilk Test Statistic	0.941
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	6.791	95% H-UCL	142.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.57
95% Adjusted-CLT UCL	7.177	97.5% Chebyshev (MVUE) UCL	27.07
95% Modified-t UCL	6.885	99% Chebyshev (MVUE) UCL	39.86

Gamma Distribution Test		Data Distribution	
		Data appear Gamma Distributed at 5% Significance Level	
k star (bias corrected)	0.405		
Theta Star	9.953		
nu star	10.53		
Approximate Chi Square Value (.05)	4.277	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0301	95% CLT UCL	6.579
Adjusted Chi Square Value	3.726	95% Jackknife UCL	6.791
		95% Standard Bootstrap UCL	6.53
Anderson-Darling Test Statistic	0.599	95% Bootstrap-t UCL	7.638
Anderson-Darling 5% Critical Value	0.798	95% Hall's Bootstrap UCL	6.441
Kolmogorov-Smirnov Test Statistic	0.229	95% Percentile Bootstrap UCL	6.567
Kolmogorov-Smirnov 5% Critical Value	0.251	95% BCA Bootstrap UCL	6.792
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	10.78
		97.5% Chebyshev(Mean, Sd) UCL	13.7
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.44
95% Approximate Gamma UCL	9.928		
95% Adjusted Gamma UCL	11.4		

Potential UCL to Use	**Use 95% Adjusted Gamma UCL**	**11.4**

U-238 SWMU 30 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

U-238 SWMU 30 Subsurface

General Statistics			
Number of Valid			
Samples	19	Number of Detected Data	17
Number of Unique Samples	17	Number of Non-Detect Data	2
		Percent Non-Detects	10.53%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.181	Minimum Detected	-1.709
Maximum Detected	565	Maximum Detected	6.337
Mean of Detected	73.61	Mean of Detected	2.475
SD of Detected	141.9	SD of Detected	2.32
Minimum Non-Detect	0.0868	Minimum Non-Detect	-2.444
Maximum Non-Detect	0.118	Maximum Non-Detect	-2.137
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	2
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	17
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	10.53%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.573	Shapiro Wilk Test Statistic	0.96
5% Shapiro Wilk Critical Value	0.892	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	65.87	Mean	1.9
SD	135.8	SD	2.784
95% DL/2 (t) UCL	119.9	95% H-Stat (DL/2) UCL	4143
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	55.81	Mean in Log Scale	1.908
SD	142.4	SD in Log Scale	2.769
95% MLE (t) UCL	112.5	Mean in Original Scale	65.87
95% MLE (Tiku) UCL	108.6	SD in Original Scale	135.8
		95% Percentile Bootstrap UCL	122.3
		95% BCA Bootstrap UCL	147.9
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data appear Gamma Distributed at 5% Significance	
k star (bias corrected)	0.341	Level	
Theta Star	216.1		
nu star	11.58		
A-D Test Statistic	0.535	Nonparametric Statistics	
5% A-D Critical Value	0.827	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.827	Mean	65.88
5% K-S Critical Value	0.225	SD	132.2
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	31.26
		95% KM (t) UCL	120.1
Assuming Gamma Distribution		95% KM (z) UCL	117.3
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	119.9

Minimum	0	95% KM (bootstrap t) UCL	195.5
Maximum	565	95% KM (BCA) UCL	121.1
Mean	65.86	95% KM (Percentile Bootstrap) UCL	123.4
Median	8.2	95% KM (Chebyshev) UCL	202.1
SD	135.8	97.5% KM (Chebyshev) UCL	261.1
k star	0.187	99% KM (Chebyshev) UCL	376.9
Theta star	352.8		
Nu star	7.095	**Potential UCLs to Use**	
AppChi2	2.223	**95% KM (Chebyshev) UCL**	**202.1**
95% Gamma Approximate UCL	210.2		
95% Adjusted Gamma UCL	234.6		

SWMU 145 SUBSURFACE SAMPLES

Arsenic SWMU 145 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File	WorkSheet.wst		
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

Arsenic SWMU 145 Subsurface

General Statistics			
Number of Valid Samples	49	Number of Detected Data	40
Number of Unique Samples	29	Number of Non-Detect Data	9
		Percent Non-Detects	18.37%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	3.1	Minimum Detected	1.131
Maximum Detected	14.7	Maximum Detected	2.688
Mean of Detected	6.404	Mean of Detected	1.76
SD of Detected	2.979	SD of Detected	0.44
Minimum Non-Detect	0.859	Minimum Non-Detect	-0.152
Maximum Non-Detect	5	Maximum Non-Detect	1.609
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	24
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	25
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	48.98%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.88	Shapiro Wilk Test Statistic	0.938
5% Shapiro Wilk Critical Value	0.94	5% Shapiro Wilk Critical Value	0.94
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	5.645	Mean	1.569
SD	3.147	SD	0.617
95% DL/2 (t) UCL	6.399	95% H-Stat (DL/2) UCL	6.252
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	5.012	Mean in Log Scale	1.658
SD	3.969	SD in Log Scale	0.471
95% MLE (t) UCL	5.963	Mean in Original Scale	5.866
95% MLE (Tiku) UCL	6.172	SD in Original Scale	2.948
		95% Percentile Bootstrap UCL	6.543
		95% BCA Bootstrap UCL	6.656
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	4.954	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	1.293		
nu star	396.3		
A-D Test Statistic	0.697	Nonparametric Statistics	
5% A-D Critical Value	0.751	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.751	Mean	5.88
5% K-S Critical Value	0.14	SD	2.884
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.418
		95% KM (t) UCL	6.582
Assuming Gamma Distribution		95% KM (z) UCL	6.569

Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	6.581
Minimum	0.234	95% KM (bootstrap t) UCL	6.699
Maximum	14.7	95% KM (BCA) UCL	6.637
Mean	6.066	95% KM (Percentile Bootstrap) UCL	6.561
Median	6	95% KM (Chebyshev) UCL	7.704
SD	2.93	97.5% KM (Chebyshev) UCL	8.493
k star	3.535	99% KM (Chebyshev) UCL	10.04
Theta star	1.716		
Nu star	346.5	**Potential UCLs to Use**	
AppChi2	304.3	**95% KM (BCA) UCL**	**6.637**
95% Gamma Approximate UCL	6.906		
95% Adjusted Gamma UCL	6.933		

Barium SWMU 145 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Barium SWMU 145 Subsurface

General Statistics

Number of Valid Samples	17	Number of Unique Samples	17
Raw Statistics		Log-transformed Statistics	
Minimum	43.7	Minimum of Log Data	3.777
Maximum	300	Maximum of Log Data	5.704
Mean	111.3	Mean of log Data	4.631
Median	97.3	SD of log Data	0.396
SD	54.75		
Coefficient of Variation	0.492		
Skewness	2.722		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.714	Shapiro Wilk Test Statistic	0.915
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	134.5	95% H-UCL	134.5
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	157.7
95% Adjusted-CLT UCL	142.5	97.5% Chebyshev (MVUE) UCL	178.1
95% Modified-t UCL	136	99% Chebyshev (MVUE) UCL	218.3
Gamma Distribution Test		Data Distribution	
		Data Follow Appr. Gamma Distribution at 5% Significance Level	
k star (bias corrected)	5.222		
Theta Star	21.32		
nu star	177.5		
Approximate Chi Square Value (.05)	147.7	Nonparametric Statistics	
Adjusted Level of Significance	0.0346	95% CLT UCL	133.2
Adjusted Chi Square Value	144.9	95% Jackknife UCL	134.5
		95% Standard Bootstrap UCL	132.7
Anderson-Darling Test Statistic	0.806	95% Bootstrap-t UCL	153.4
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	237.6
Kolmogorov-Smirnov Test Statistic	0.165	95% Percentile Bootstrap UCL	134.9
Kolmogorov-Smirnov 5% Critical Value	0.21	95% BCA Bootstrap UCL	143.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	169.2
		97.5% Chebyshev(Mean, Sd) UCL	194.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	243.5
95% Approximate Gamma UCL	133.8		
95% Adjusted Gamma UCL	136.4		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**133.8**

Uranium SWMU 145 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Uranium SWMU 145 Subsurface

General Statistics			
Number of Valid Samples	17	Number of Detected Data	11
Number of Unique Samples	9	Number of Non-Detect Data	6
		Percent Non-Detects	35.29%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.976	Minimum Detected	-0.0243
Maximum Detected	311	Maximum Detected	5.74
Mean of Detected	50.63	Mean of Detected	2.167
SD of Detected	96.8	SD of Detected	2.052
Minimum Non-Detect	0.859	Minimum Non-Detect	-0.152
Maximum Non-Detect	1.15	Maximum Non-Detect	0.14
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	9
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	47.06%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.596	Shapiro Wilk Test Statistic	0.886
5% Shapiro Wilk Critical Value	0.85	5% 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	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	32.93	Mean	1.145
SD	80.41	SD	2.161
95% DL/2 (t) UCL	66.98	95% H-Stat (DL/2) UCL	78.29
Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.498
		SD in Log Scale	2.852
		Mean in Original Scale	32.79
		SD in Original Scale	80.47
		95% Percentile Bootstrap UCL	66.97
		95% BCA Bootstrap UCL	83.5
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
		Data Follow Appr. Gamma Distribution at 5% Significance	
k star (bias corrected)	0.335	Level	
Theta Star	151		
nu star	7.379		
A-D Test Statistic	0.83	Nonparametric Statistics	
5% A-D Critical Value	0.805	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.805	Mean	33.11
5% K-S Critical Value	0.273	SD	77.94
Data follow Appr. Gamma Distribution at 5% Significance Level		SE of Mean	19.83
		95% KM (t) UCL	67.72
Assuming Gamma Distribution		95% KM (z) UCL	65.72
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	67.12
Minimum	0	95% KM (bootstrap t) UCL	213.4
Maximum	311	95% KM (BCA) UCL	67.52

Mean	32.76	95% KM (Percentile Bootstrap) UCL	69.23
Median	1.9	95% KM (Chebyshev) UCL	119.5
SD	80.49	97.5% KM (Chebyshev) UCL	156.9
k star	0.112	99% KM (Chebyshev) UCL	230.4
Theta star	293.8		
Nu star	3.791	**Potential UCLs to Use**	
AppChi2	0.641	**95% KM (BCA) UCL**	**67.52**
95% Gamma Approximate UCL	193.8		
95% Adjusted Gamma UCL	237.4		

Th-230 SWMU 145 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Th-230 SWMU 145 Subsurface

General Statistics

Number of Valid Samples	18	Number of Unique Samples	18
Raw Statistics		Log-transformed Statistics	
Minimum	0.237	Minimum of Log Data	-1.44
Maximum	4.5	Maximum of Log Data	1.504
Mean	0.728	Mean of log Data	-0.653
Median	0.436	SD of log Data	0.688
SD	0.973		
Coefficient of Variation	1.337		
Skewness	3.82		
Relevant UCL Statistics			
Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.461	Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical Value	0.897	Shapiro Wilk Critical Value	0.897
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
95% Student's-t UCL	1.127	95% H-UCL	0.958
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.137
95% Adjusted-CLT UCL	1.326	97.5% Chebyshev (MVUE) UCL	1.347
95% Modified-t UCL	1.161	99% Chebyshev (MVUE) UCL	1.761
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.402	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.519		
nu star	50.46		
Approximate Chi Square Value (.05)	35.15	Nonparametric Statistics	
Adjusted Level of Significance	0.0357	95% CLT UCL	1.105
Adjusted Chi Square Value	33.92	95% Jackknife UCL	1.127
		95% Standard Bootstrap UCL	1.095
Anderson-Darling Test Statistic	1.787	95% Bootstrap-t UCL	2.283
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	2.502
Kolmogorov-Smirnov Test Statistic	0.232	95% Percentile Bootstrap UCL	1.173
Kolmogorov-Smirnov 5% Critical Value	0.207	95% BCA Bootstrap UCL	1.399
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.727
		97.5% Chebyshev(Mean, Sd) UCL	2.16
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	3.009
95% Approximate Gamma UCL	1.045		
95% Adjusted Gamma UCL	1.083		
Potential UCL to Use		**Use 95% Chebyshev (Mean, Sd) UCL**	**1.727**

U-235 SWMU 145 Subsurface

General UCL Statistics for Full Data Sets

User Selected Options	
From File	
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

U-235 SWMU 145 Subsurface

General Statistics

Number of Valid Samples	19	Number of Unique Samples	19
Raw Statistics		Log-transformed Statistics	
Minimum	0.041	Minimum of Log Data	-3.194
Maximum	2.2	Maximum of Log Data	0.788
Mean	0.454	Mean of log Data	-1.28
Median	0.33	SD of log Data	1.111
SD	0.488		
Coefficient of Variation	1.076		
Skewness	2.732		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Shapiro Wilk Test Statistic	0.708	Shapiro Wilk Test Statistic	0.909
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	0.648	95% H-UCL	1.07
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1.109
95% Adjusted-CLT UCL	0.713	97.5% Chebyshev (MVUE) UCL	1.377
95% Modified-t UCL	0.66	99% Chebyshev (MVUE) UCL	1.902
Gamma Distribution Test		Data Distribution	
k star (bias corrected)	1.011	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.449		
nu star	38.42		
Approximate Chi Square Value (.05)	25.22	Nonparametric Statistics	
Adjusted Level of Significance	0.0369	95% CLT UCL	0.638
Adjusted Chi Square Value	24.29	95% Jackknife UCL	0.648
		95% Standard Bootstrap UCL	0.635
Anderson-Darling Test Statistic	0.478	95% Bootstrap-t UCL	0.807
Anderson-Darling 5% Critical Value	0.765	95% Hall's Bootstrap UCL	1.483
Kolmogorov-Smirnov Test Statistic	0.132	95% Percentile Bootstrap UCL	0.652
Kolmogorov-Smirnov 5% Critical Value	0.204	95% BCA Bootstrap UCL	0.729
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.942
		97.5% Chebyshev(Mean, Sd) UCL	1.154
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.569
95% Approximate Gamma UCL	0.691		
95% Adjusted Gamma UCL	0.718		
Potential UCL to Use		**Use 95% Approximate Gamma UCL**	**0.691**

U-238 SWMU 145 Subsurface

General UCL Statistics for Data Sets with Non-Detects

User Selected Options			
From File			
Full Precision	OFF		
Confidence Coefficient	95%		
Number of Bootstrap Operations	2000		

U-238 SWMU 145 Subsurface

General Statistics			
Number of Valid			
Samples	27	Number of Detected Data	20
Number of Unique Samples	19	Number of Non-Detect Data	7
		Percent Non-Detects	25.93%
Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.123	Minimum Detected	-2.096
Maximum Detected	326	Maximum Detected	5.787
Mean of Detected	33.64	Mean of Detected	1.439
SD of Detected	74.27	SD of Detected	2.437
Minimum Non-Detect	0.00174	Minimum Non-Detect	-6.354
Maximum Non-Detect	1.91	Maximum Non-Detect	0.647
Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	15
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	12
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	55.56%
UCL Statistics			
Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.498	Shapiro Wilk Test Statistic	0.945
5% Shapiro Wilk Critical Value	0.905	5% Shapiro Wilk Critical Value	0.905
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	24.99	Mean	0.37
SD	65.21	SD	3.017
95% DL/2 (t) UCL	46.4	95% H-Stat (DL/2) UCL	792.4
Maximum Likelihood Estimate(MLE) Method N/A		Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	0.229
		SD in Log Scale	3.006
		Mean in Original Scale	24.93
		SD in Original Scale	65.24
		95% Percentile Bootstrap UCL	47.88
		95% BCA Bootstrap UCL	61.44
Gamma Distribution Test with Detected Values Only		Data Distribution Test with Detected Values Only	
k star (bias corrected)	0.312	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	107.9		
nu star	12.47		
A-D Test Statistic	0.632	Nonparametric Statistics	
5% A-D Critical Value	0.839	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.839	Mean	24.97
5% K-S Critical Value	0.209	SD	64
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	12.64
		95% KM (t) UCL	46.52
Assuming Gamma Distribution		95% KM (z) UCL	45.75
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	46.38
Minimum	0	95% KM (bootstrap t) UCL	92.15
Maximum	326	95% KM (BCA) UCL	48.74

Mean	24.92	95% KM (Percentile Bootstrap) UCL	47.44
Median	0.65	95% KM (Chebyshev) UCL	80.05
SD	65.24	97.5% KM (Chebyshev) UCL	103.9
k star	0.12	99% KM (Chebyshev) UCL	150.7
Theta star	207.9		
Nu star	6.471	**Potential UCLs to Use**	
AppChi2	1.885	**95% KM (Chebyshev) UCL**	**80.05**
95% Gamma Approximate UCL	85.53		
95% Adjusted Gamma UCL	93.12		