	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation			2/18/2015 11:26:56 AM								
5	From File			EPC_015Surf_EU05.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												

	A	B	C	D	E	F	G	H	I	J	K	L
11	Antimony											
12												
13						General Statistics						
14					Total Number of Observations	12				Number of Distinct Observations		12
15										Number of Missing Observations		0
16					Minimum	46.02				Mean		88.02
17					Maximum	125.4				Median		94.06
18					SD	25.35				Std. Error of Mean		7.316
19					Coefficient of Variation	0.288				Skewness		-0.132
20												
21						Normal GOF Test						
22					Shapiro Wilk Test Statistic	0.961				Shapiro Wilk GOF Test		
23					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
24					Lilliefors Test Statistic	0.144				Lilliefors GOF Test		
25					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
26						Data appear Normal at 5% Significance Level						
27												
28						Assuming Normal Distribution						
29					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
30					95% Student's-t UCL	101.2				95% Adjusted-CLT UCL (Chen-1995)		99.76
31										95% Modified-t UCL (Johnson-1978)		101.1
32												
33						Gamma GOF Test						
34					A-D Test Statistic	0.292				Anderson-Darling Gamma GOF Test		
35					5% A-D Critical Value	0.731				Detected data appear Gamma Distributed at 5% Significance Level		
36					K-S Test Statistic	0.181				Kolmogrov-Smirnoff Gamma GOF Test		
37					5% K-S Critical Value	0.245				Detected data appear Gamma Distributed at 5% Significance Level		
38						Detected data appear Gamma Distributed at 5% Significance Level						
39												
40						Gamma Statistics						
41					k hat (MLE)	12.04				k star (bias corrected MLE)		9.088
42					Theta hat (MLE)	7.309				Theta star (bias corrected MLE)		9.685
43					nu hat (MLE)	289				nu star (bias corrected)		218.1
44					MLE Mean (bias corrected)	88.02				MLE Sd (bias corrected)		29.2
45										Approximate Chi Square Value (0.05)		184.9
46					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		180.3
47												
48						Assuming Gamma Distribution						
49					95% Approximate Gamma UCL (use when n>=50))	103.8				95% Adjusted Gamma UCL (use when n<50)		106.5
50												
51						Lognormal GOF Test						
52					Shapiro Wilk Test Statistic	0.943				Shapiro Wilk Lognormal GOF Test		
53					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
54					Lilliefors Test Statistic	0.191				Lilliefors Lognormal GOF Test		
55					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
56						Data appear Lognormal at 5% Significance Level						
57												
58						Lognormal Statistics						
59					Minimum of Logged Data	3.829				Mean of logged Data		4.436
60					Maximum of Logged Data	4.832				SD of logged Data		0.312
61												

	A	B	C	D	E	F	G	H	I	J	K	L
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	106.3				90% Chebyshev (MVUE) UCL		112.3
64					95% Chebyshev (MVUE) UCL	123.2				97.5% Chebyshev (MVUE) UCL		138.3
65					99% Chebyshev (MVUE) UCL	168.1						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	100.1				95% Jackknife UCL		101.2
72					95% Standard Bootstrap UCL	99.54				95% Bootstrap-t UCL		100.5
73					95% Hall's Bootstrap UCL	99.65				95% Percentile Bootstrap UCL		99.27
74					95% BCA Bootstrap UCL	99.33						
75					90% Chebyshev(Mean, Sd) UCL	110				95% Chebyshev(Mean, Sd) UCL		119.9
76					97.5% Chebyshev(Mean, Sd) UCL	133.7				99% Chebyshev(Mean, Sd) UCL		160.8
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	101.2						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
87	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
88												
89												

	A	B	C	D	E	F	G	H	I	J	K	L
90	Arsenic											
91												
92						General Statistics						
93					Total Number of Observations	12				Number of Distinct Observations		6
94										Number of Missing Observations		0
95					Minimum	6.52				Mean		11.26
96					Maximum	19.15				Median		11
97					SD	2.951				Std. Error of Mean		0.852
98					Coefficient of Variation	0.262				Skewness		1.536
99												
100						Normal GOF Test						
101					Shapiro Wilk Test Statistic	0.748				Shapiro Wilk GOF Test		
102					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
103					Lilliefors Test Statistic	0.299				Lilliefors GOF Test		
104					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
105						Data Not Normal at 5% Significance Level						
106												
107						Assuming Normal Distribution						
108					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
109					95% Student's-t UCL	12.79				95% Adjusted-CLT UCL (Chen-1995)		13.06
110										95% Modified-t UCL (Johnson-1978)		12.85
111												
112						Gamma GOF Test						
113					A-D Test Statistic	1.391				Anderson-Darling Gamma GOF Test		
114					5% A-D Critical Value	0.731				Data Not Gamma Distributed at 5% Significance Level		
115					K-S Test Statistic	0.327				Kolmogrov-Smirnoff Gamma GOF Test		
116					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
117						Data Not Gamma Distributed at 5% Significance Level						
118												
119						Gamma Statistics						
120					k hat (MLE)	17.51				k star (bias corrected MLE)		13.19
121					Theta hat (MLE)	0.643				Theta star (bias corrected MLE)		0.853
122					nu hat (MLE)	420.3				nu star (bias corrected)		316.6
123					MLE Mean (bias corrected)	11.26				MLE Sd (bias corrected)		3.099
124										Approximate Chi Square Value (0.05)		276.4
125					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		270.6
126												
127						Assuming Gamma Distribution						
128					95% Approximate Gamma UCL (use when n>=50))	12.89				95% Adjusted Gamma UCL (use when n<50)		13.17
129												
130						Lognormal GOF Test						
131					Shapiro Wilk Test Statistic	0.803				Shapiro Wilk Lognormal GOF Test		
132					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
133					Lilliefors Test Statistic	0.343				Lilliefors Lognormal GOF Test		
134					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
135						Data Not Lognormal at 5% Significance Level						
136												
137						Lognormal Statistics						
138					Minimum of Logged Data	1.875				Mean of logged Data		2.392
139					Maximum of Logged Data	2.952				SD of logged Data		0.249
140												

	A	B	C	D	E	F	G	H	I	J	K	L
141					Assuming Lognormal Distribution							
142					95% H-UCL	12.99				90% Chebyshev (MVUE) UCL		13.69
143					95% Chebyshev (MVUE) UCL	14.79				97.5% Chebyshev (MVUE) UCL		16.33
144					99% Chebyshev (MVUE) UCL	19.34						
145												
146					Nonparametric Distribution Free UCL Statistics							
147					Data do not follow a Discernible Distribution (0.05)							
148												
149					Nonparametric Distribution Free UCLs							
150					95% CLT UCL	12.66				95% Jackknife UCL		12.79
151					95% Standard Bootstrap UCL	12.56				95% Bootstrap-t UCL		13.17
152					95% Hall's Bootstrap UCL	21.27				95% Percentile Bootstrap UCL		12.59
153					95% BCA Bootstrap UCL	12.99						
154					90% Chebyshev(Mean, Sd) UCL	13.81				95% Chebyshev(Mean, Sd) UCL		14.97
155					97.5% Chebyshev(Mean, Sd) UCL	16.58				99% Chebyshev(Mean, Sd) UCL		19.73
156												
157					Suggested UCL to Use							
158					95% Student's-t UCL	12.79				or 95% Modified-t UCL		12.85
159												
160	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
161	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
162	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
163	For additional insight the user may want to consult a statistician.											
164												
165												

	A	B	C	D	E	F	G	H	I	J	K	L
166	Cadmium											
167												
168						General Statistics						
169					Total Number of Observations	12				Number of Distinct Observations		5
170										Number of Missing Observations		0
171					Minimum	12				Mean		13.26
172					Maximum	20.65				Median		12
173					SD	2.549				Std. Error of Mean		0.736
174					Coefficient of Variation	0.192				Skewness		2.587
175												
176						Normal GOF Test						
177					Shapiro Wilk Test Statistic	0.583				Shapiro Wilk GOF Test		
178					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
179					Lilliefors Test Statistic	0.357				Lilliefors GOF Test		
180					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
181						Data Not Normal at 5% Significance Level						
182												
183						Assuming Normal Distribution						
184					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
185					95% Student's-t UCL	14.58				95% Adjusted-CLT UCL (Chen-1995)		15.06
186										95% Modified-t UCL (Johnson-1978)		14.68
187												
188						Gamma GOF Test						
189					A-D Test Statistic	2.039				Anderson-Darling Gamma GOF Test		
190					5% A-D Critical Value	0.731				Data Not Gamma Distributed at 5% Significance Level		
191					K-S Test Statistic	0.373				Kolmogrov-Smirnoff Gamma GOF Test		
192					5% K-S Critical Value	0.245				Data Not Gamma Distributed at 5% Significance Level		
193						Data Not Gamma Distributed at 5% Significance Level						
194												
195						Gamma Statistics						
196					k hat (MLE)	36.75				k star (bias corrected MLE)		27.62
197					Theta hat (MLE)	0.361				Theta star (bias corrected MLE)		0.48
198					nu hat (MLE)	882				nu star (bias corrected)		662.8
199					MLE Mean (bias corrected)	13.26				MLE Sd (bias corrected)		2.524
200										Approximate Chi Square Value (0.05)		604.1
201					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		595.5
202												
203						Assuming Gamma Distribution						
204					95% Approximate Gamma UCL (use when n>=50))	14.55				95% Adjusted Gamma UCL (use when n<50)		14.76
205												
206						Lognormal GOF Test						
207					Shapiro Wilk Test Statistic	0.618				Shapiro Wilk Lognormal GOF Test		
208					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
209					Lilliefors Test Statistic	0.368				Lilliefors Lognormal GOF Test		
210					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
211						Data Not Lognormal at 5% Significance Level						
212												
213						Lognormal Statistics						
214					Minimum of Logged Data	2.485				Mean of logged Data		2.571
215					Maximum of Logged Data	3.028				SD of logged Data		0.164
216												

	A	B	C	D	E	F	G	H	I	J	K	L
217					Assuming Lognormal Distribution							
218					95% H-UCL	14.5				90% Chebyshev (MVUE) UCL		15.13
219					95% Chebyshev (MVUE) UCL	15.98				97.5% Chebyshev (MVUE) UCL		17.17
220					99% Chebyshev (MVUE) UCL	19.49						
221												
222					Nonparametric Distribution Free UCL Statistics							
223					Data do not follow a Discernible Distribution (0.05)							
224												
225					Nonparametric Distribution Free UCLs							
226					95% CLT UCL	14.47				95% Jackknife UCL		14.58
227					95% Standard Bootstrap UCL	14.42				95% Bootstrap-t UCL		16.39
228					95% Hall's Bootstrap UCL	18.08				95% Percentile Bootstrap UCL		14.49
229					95% BCA Bootstrap UCL	14.94						
230					90% Chebyshev(Mean, Sd) UCL	15.47				95% Chebyshev(Mean, Sd) UCL		16.47
231					97.5% Chebyshev(Mean, Sd) UCL	17.86				99% Chebyshev(Mean, Sd) UCL		20.59
232												
233					Suggested UCL to Use							
234					95% Student's-t UCL	14.58				or 95% Modified-t UCL		14.68
235												
236					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
237					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
238					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
239					For additional insight the user may want to consult a statistician.							
240												
241												

	A	B	C	D	E	F	G	H	I	J	K	L
242	Chromium											
243												
244					General Statistics							
245					Total Number of Observations	12				Number of Distinct Observations		4
246										Number of Missing Observations		0
247					Minimum	32.22				Mean		72.78
248					Maximum	85				Median		85
249					SD	22.24				Std. Error of Mean		6.419
250					Coefficient of Variation	0.306				Skewness		-1.373
251												
252					Normal GOF Test							
253					Shapiro Wilk Test Statistic	0.576				Shapiro Wilk GOF Test		
254					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
255					Lilliefors Test Statistic	0.459				Lilliefors GOF Test		
256					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
257					Data Not Normal at 5% Significance Level							
258												
259					Assuming Normal Distribution							
260					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
261					95% Student's-t UCL	84.31				95% Adjusted-CLT UCL (Chen-1995)		80.62
262										95% Modified-t UCL (Johnson-1978)		83.89
263												
264					Gamma GOF Test							
265					A-D Test Statistic	2.683				Anderson-Darling Gamma GOF Test		
266					5% A-D Critical Value	0.731				Data Not Gamma Distributed at 5% Significance Level		
267					K-S Test Statistic	0.467				Kolmogrov-Smirnoff Gamma GOF Test		
268					5% K-S Critical Value	0.246				Data Not Gamma Distributed at 5% Significance Level		
269					Data Not Gamma Distributed at 5% Significance Level							
270												
271					Gamma Statistics							
272					k hat (MLE)	8.397				k star (bias corrected MLE)		6.354
273					Theta hat (MLE)	8.668				Theta star (bias corrected MLE)		11.46
274					nu hat (MLE)	201.5				nu star (bias corrected)		152.5
275					MLE Mean (bias corrected)	72.78				MLE Sd (bias corrected)		28.88
276										Approximate Chi Square Value (0.05)		124.9
277					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		121.1
278												
279					Assuming Gamma Distribution							
280					95% Approximate Gamma UCL (use when n>=50))	88.83				95% Adjusted Gamma UCL (use when n<50)		91.62
281												
282					Lognormal GOF Test							
283					Shapiro Wilk Test Statistic	0.583				Shapiro Wilk Lognormal GOF Test		
284					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
285					Lilliefors Test Statistic	0.457				Lilliefors Lognormal GOF Test		
286					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
287					Data Not Lognormal at 5% Significance Level							
288												
289					Lognormal Statistics							
290					Minimum of Logged Data	3.473				Mean of logged Data		4.227
291					Maximum of Logged Data	4.443				SD of logged Data		0.396
292												

	A	B	C	D	E	F	G	H	I	J	K	L
293	**Assuming Lognormal Distribution**											
294					95% H-UCL	94.31				90% Chebyshev (MVUE) UCL		99.2
295					95% Chebyshev (MVUE) UCL	110.8				97.5% Chebyshev (MVUE) UCL		126.9
296					99% Chebyshev (MVUE) UCL	158.6						
297												
298	**Nonparametric Distribution Free UCL Statistics**											
299	**Data do not follow a Discernible Distribution (0.05)**											
300												
301	**Nonparametric Distribution Free UCLs**											
302					95% CLT UCL	83.34				95% Jackknife UCL		84.31
303					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
304					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
305					95% BCA Bootstrap UCL	N/A						
306					90% Chebyshev(Mean, Sd) UCL	92.04				95% Chebyshev(Mean, Sd) UCL		100.8
307					97.5% Chebyshev(Mean, Sd) UCL	112.9				99% Chebyshev(Mean, Sd) UCL		136.7
308												
309	**Suggested UCL to Use**											
310					95% Student's-t UCL	84.31				or 95% Modified-t UCL		83.89
311												
312	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
313	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
314	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
315	For additional insight the user may want to consult a statistician.											
316												
317	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
318	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
319												
320												

	A	B	C	D	E	F	G	H	I	J	K	L
321	Copper											
322												
323						General Statistics						
324					Total Number of Observations	12				Number of Distinct Observations		12
325										Number of Missing Observations		0
326					Minimum	21.89				Mean		711.9
327					Maximum	6122				Median		245.9
328					SD	1713				Std. Error of Mean		494.5
329					Coefficient of Variation	2.406				Skewness		3.398
330												
331						Normal GOF Test						
332					Shapiro Wilk Test Statistic	0.42				Shapiro Wilk GOF Test		
333					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
334					Lilliefors Test Statistic	0.451				Lilliefors GOF Test		
335					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
336						Data Not Normal at 5% Significance Level						
337												
338						Assuming Normal Distribution						
339					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
340					95% Student's-t UCL	1600				95% Adjusted-CLT UCL (Chen-1995)		2044
341										95% Modified-t UCL (Johnson-1978)		1681
342												
343						Gamma GOF Test						
344					A-D Test Statistic	1.057				Anderson-Darling Gamma GOF Test		
345					5% A-D Critical Value	0.792				Data Not Gamma Distributed at 5% Significance Level		
346					K-S Test Statistic	0.281				Kolmogrov-Smirnoff Gamma GOF Test		
347					5% K-S Critical Value	0.26				Data Not Gamma Distributed at 5% Significance Level		
348						Data Not Gamma Distributed at 5% Significance Level						
349												
350						Gamma Statistics						
351					k hat (MLE)	0.466				k star (bias corrected MLE)		0.405
352					Theta hat (MLE)	1529				Theta star (bias corrected MLE)		1759
353					nu hat (MLE)	11.17				nu star (bias corrected)		9.714
354					MLE Mean (bias corrected)	711.9				MLE Sd (bias corrected)		1119
355										Approximate Chi Square Value (0.05)		3.764
356					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		3.219
357												
358						Assuming Gamma Distribution						
359					95% Approximate Gamma UCL (use when n>=50))	1837				95% Adjusted Gamma UCL (use when n<50)		2148
360												
361						Lognormal GOF Test						
362					Shapiro Wilk Test Statistic	0.919				Shapiro Wilk Lognormal GOF Test		
363					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
364					Lilliefors Test Statistic	0.155				Lilliefors Lognormal GOF Test		
365					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
366						Data appear Lognormal at 5% Significance Level						
367												
368						Lognormal Statistics						
369					Minimum of Logged Data	3.086				Mean of logged Data		5.188
370					Maximum of Logged Data	8.72				SD of logged Data		1.62
371												

	A	B	C	D	E	F	G	H	I	J	K	L
372					Assuming Lognormal Distribution							
373					95% H-UCL	5047				90% Chebyshev (MVUE) UCL		1381
374					95% Chebyshev (MVUE) UCL	1760				97.5% Chebyshev (MVUE) UCL		2285
375					99% Chebyshev (MVUE) UCL	3319						
376												
377					Nonparametric Distribution Free UCL Statistics							
378					Data appear to follow a Discernible Distribution at 5% Significance Level							
379												
380					Nonparametric Distribution Free UCLs							
381					95% CLT UCL	1525				95% Jackknife UCL		1600
382					95% Standard Bootstrap UCL	1488				95% Bootstrap-t UCL		6860
383					95% Hall's Bootstrap UCL	5481				95% Percentile Bootstrap UCL		1678
384					95% BCA Bootstrap UCL	2225						
385					90% Chebyshev(Mean, Sd) UCL	2195				95% Chebyshev(Mean, Sd) UCL		2867
386					97.5% Chebyshev(Mean, Sd) UCL	3800				99% Chebyshev(Mean, Sd) UCL		5632
387												
388					Suggested UCL to Use							
389					99% Chebyshev (Mean, Sd) UCL	5632						
390												
391					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
392					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
393					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
394					For additional insight the user may want to consult a statistician.							
395												
396												
397	Neptunium-237											
398												
399					General Statistics							
400					Total Number of Observations	12				Number of Distinct Observations		1
401										Number of Missing Observations		0
402					Minimum	0.69				Mean		0.69
403					Maximum	0.69				Median		0.69
404												
405					Warning: There is only one distinct observation value in this data set - resulting in '0' variance!							
406					ProUCL (or any other software) should not be used on such a data set!							
407					The data set for variable Neptunium-237 was not processed!							
408												
409					If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.							
410					The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
411												
412												
413												

	A	B	C	D	E	F	G	H	I	J	K	L
414	Nickel											
415												
416						General Statistics						
417					Total Number of Observations	12				Number of Distinct Observations		8
418										Number of Missing Observations		0
419					Minimum	65				Mean		242.6
420					Maximum	676				Median		164
421					SD	212.7				Std. Error of Mean		61.39
422					Coefficient of Variation	0.877				Skewness		0.916
423												
424						Normal GOF Test						
425					Shapiro Wilk Test Statistic	0.815				Shapiro Wilk GOF Test		
426					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
427					Lilliefors Test Statistic	0.215				Lilliefors GOF Test		
428					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
429						Data appear Approximate Normal at 5% Significance Level						
430												
431						Assuming Normal Distribution						
432					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
433					95% Student's-t UCL	352.8				95% Adjusted-CLT UCL (Chen-1995)		360.9
434										95% Modified-t UCL (Johnson-1978)		355.5
435												
436						Gamma GOF Test						
437					A-D Test Statistic	0.879				Anderson-Darling Gamma GOF Test		
438					5% A-D Critical Value	0.747				Data Not Gamma Distributed at 5% Significance Level		
439					K-S Test Statistic	0.258				Kolmogrov-Smirnoff Gamma GOF Test		
440					5% K-S Critical Value	0.25				Data Not Gamma Distributed at 5% Significance Level		
441						Data Not Gamma Distributed at 5% Significance Level						
442												
443						Gamma Statistics						
444					k hat (MLE)	1.441				k star (bias corrected MLE)		1.136
445					Theta hat (MLE)	168.4				Theta star (bias corrected MLE)		213.5
446					nu hat (MLE)	34.58				nu star (bias corrected)		27.27
447					MLE Mean (bias corrected)	242.6				MLE Sd (bias corrected)		227.6
448										Approximate Chi Square Value (0.05)		16.36
449					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		15.08
450												
451						Assuming Gamma Distribution						
452					95% Approximate Gamma UCL (use when n>=50))	404.4				95% Adjusted Gamma UCL (use when n<50)		438.6
453												
454						Lognormal GOF Test						
455					Shapiro Wilk Test Statistic	0.831				Shapiro Wilk Lognormal GOF Test		
456					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
457					Lilliefors Test Statistic	0.257				Lilliefors Lognormal GOF Test		
458					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
459						Data Not Lognormal at 5% Significance Level						
460												
461						Lognormal Statistics						
462					Minimum of Logged Data	4.174				Mean of logged Data		5.106
463					Maximum of Logged Data	6.516				SD of logged Data		0.935
464												

	A	B	C	D	E	F	G	H	I	J	K	L
465					Assuming Lognormal Distribution							
466					95% H-UCL	561.8				90% Chebyshev (MVUE) UCL		453
467					95% Chebyshev (MVUE) UCL	547.9				97.5% Chebyshev (MVUE) UCL		679.6
468					99% Chebyshev (MVUE) UCL	938.5						
469												
470					Nonparametric Distribution Free UCL Statistics							
471					Data appear to follow a Discernible Distribution at 5% Significance Level							
472												
473					Nonparametric Distribution Free UCLs							
474					95% CLT UCL	343.6				95% Jackknife UCL		352.8
475					95% Standard Bootstrap UCL	340.8				95% Bootstrap-t UCL		377.9
476					95% Hall's Bootstrap UCL	343.1				95% Percentile Bootstrap UCL		342
477					95% BCA Bootstrap UCL	357.3						
478					90% Chebyshev(Mean, Sd) UCL	426.8				95% Chebyshev(Mean, Sd) UCL		510.2
479					97.5% Chebyshev(Mean, Sd) UCL	626				99% Chebyshev(Mean, Sd) UCL		853.4
480												
481					Suggested UCL to Use							
482					95% Student's-t UCL	352.8						
483												
484					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
485					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
486					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
487					For additional insight the user may want to consult a statistician.							
488												
489												
490	PAH, Total											
491												
492					General Statistics							
493					Total Number of Observations	12				Number of Distinct Observations		1
494										Number of Missing Observations		0
495					Minimum	0.419				Mean		0.419
496					Maximum	0.419				Median		0.419
497												
498					Warning: There is only one distinct observation value in this data set - resulting in '0' variance!							
499					ProUCL (or any other software) should not be used on such a data set!							
500					The data set for variable PAH, Total was not processed!							
501												
502					If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.							
503					The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
504												
505												
506												

	A	B	C	D	E	F	G	H	I	J	K	L
507	PCB, Total											
508												
509						General Statistics						
510					Total Number of Observations	12				Number of Distinct Observations		3
511										Number of Missing Observations		0
512					Minimum	5				Mean		8.8
513					Maximum	50				Median		5
514					SD	12.98				Std. Error of Mean		3.746
515					Coefficient of Variation	1.475				Skewness		3.463
516												
517						Normal GOF Test						
518					Shapiro Wilk Test Statistic	0.333				Shapiro Wilk GOF Test		
519					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
520					Lilliefors Test Statistic	0.514				Lilliefors GOF Test		
521					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
522						Data Not Normal at 5% Significance Level						
523												
524						Assuming Normal Distribution						
525					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
526					95% Student's-t UCL	15.53				95% Adjusted-CLT UCL (Chen-1995)		18.96
527										95% Modified-t UCL (Johnson-1978)		16.15
528												
529						Gamma GOF Test						
530					A-D Test Statistic	4.029				Anderson-Darling Gamma GOF Test		
531					5% A-D Critical Value	0.745				Data Not Gamma Distributed at 5% Significance Level		
532					K-S Test Statistic	0.51				Kolmogrov-Smirnoff Gamma GOF Test		
533					5% K-S Critical Value	0.249				Data Not Gamma Distributed at 5% Significance Level		
534						Data Not Gamma Distributed at 5% Significance Level						
535												
536						Gamma Statistics						
537					k hat (MLE)	1.519				k star (bias corrected MLE)		1.195
538					Theta hat (MLE)	5.794				Theta star (bias corrected MLE)		7.366
539					nu hat (MLE)	36.45				nu star (bias corrected)		28.67
540					MLE Mean (bias corrected)	8.8				MLE Sd (bias corrected)		8.051
541										Approximate Chi Square Value (0.05)		17.45
542					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		16.13
543												
544						Assuming Gamma Distribution						
545					95% Approximate Gamma UCL (use when n>=50))	14.46				95% Adjusted Gamma UCL (use when n<50)		15.64
546												
547						Lognormal GOF Test						
548					Shapiro Wilk Test Statistic	0.349				Shapiro Wilk Lognormal GOF Test		
549					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
550					Lilliefors Test Statistic	0.469				Lilliefors Lognormal GOF Test		
551					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
552						Data Not Lognormal at 5% Significance Level						
553												
554						Lognormal Statistics						
555					Minimum of Logged Data	1.609				Mean of logged Data		1.811
556					Maximum of Logged Data	3.912				SD of logged Data		0.663
557												

	A	B	C	D	E	F	G	H	I	J	K	L
558					Assuming Lognormal Distribution							
559					95% H-UCL	12.2				90% Chebyshev (MVUE) UCL		11.9
560					95% Chebyshev (MVUE) UCL	13.91				97.5% Chebyshev (MVUE) UCL		16.7
561					99% Chebyshev (MVUE) UCL	22.19						
562												
563					Nonparametric Distribution Free UCL Statistics							
564					Data do not follow a Discernible Distribution (0.05)							
565												
566					Nonparametric Distribution Free UCLs							
567					95% CLT UCL	14.96				95% Jackknife UCL		15.53
568					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
569					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
570					95% BCA Bootstrap UCL	N/A						
571					90% Chebyshev(Mean, Sd) UCL	20.04				95% Chebyshev(Mean, Sd) UCL		25.13
572					97.5% Chebyshev(Mean, Sd) UCL	32.19				99% Chebyshev(Mean, Sd) UCL		46.07
573												
574					Suggested UCL to Use							
575					95% Chebyshev (Mean, Sd) UCL	25.13						
576												
577					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
578					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
579					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
580					For additional insight the user may want to consult a statistician.							
581												
582												

	A	B	C	D	E	F	G	H	I	J	K	L
583	Uranium											
584												
585					General Statistics							
586					Total Number of Observations	12				Number of Distinct Observations		10
587										Number of Missing Observations		0
588					Minimum	12.65				Mean		112
589					Maximum	364.2				Median		61.93
590					SD	122.6				Std. Error of Mean		35.38
591					Coefficient of Variation	1.094				Skewness		1.187
592												
593					Normal GOF Test							
594					Shapiro Wilk Test Statistic	0.784				Shapiro Wilk GOF Test		
595					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
596					Lilliefors Test Statistic	0.249				Lilliefors GOF Test		
597					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
598					Data appear Approximate Normal at 5% Significance Level							
599												
600					Assuming Normal Distribution							
601					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
602					95% Student's-t UCL	175.5				95% Adjusted-CLT UCL (Chen-1995)		183.1
603										95% Modified-t UCL (Johnson-1978)		177.6
604												
605					Gamma GOF Test							
606					A-D Test Statistic	0.707				Anderson-Darling Gamma GOF Test		
607					5% A-D Critical Value	0.759				Detected data appear Gamma Distributed at 5% Significance Level		
608					K-S Test Statistic	0.252				Kolmogrov-Smirnoff Gamma GOF Test		
609					5% K-S Critical Value	0.253				Detected data appear Gamma Distributed at 5% Significance Level		
610					Detected data appear Gamma Distributed at 5% Significance Level							
611												
612					Gamma Statistics							
613					k hat (MLE)	0.942				k star (bias corrected MLE)		0.762
614					Theta hat (MLE)	118.9				Theta star (bias corrected MLE)		147
615					nu hat (MLE)	22.6				nu star (bias corrected)		18.28
616					MLE Mean (bias corrected)	112				MLE Sd (bias corrected)		128.3
617										Approximate Chi Square Value (0.05)		9.596
618					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		8.651
619												
620					Assuming Gamma Distribution							
621					95% Approximate Gamma UCL (use when n>=50))	213.4				95% Adjusted Gamma UCL (use when n<50)		236.7
622												
623					Lognormal GOF Test							
624					Shapiro Wilk Test Statistic	0.891				Shapiro Wilk Lognormal GOF Test		
625					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
626					Lilliefors Test Statistic	0.221				Lilliefors Lognormal GOF Test		
627					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
628					Data appear Lognormal at 5% Significance Level							
629												
630					Lognormal Statistics							
631					Minimum of Logged Data	2.538				Mean of logged Data		4.101
632					Maximum of Logged Data	5.898				SD of logged Data		1.197
633												

	A	B	C	D	E	F	G	H	I	J	K	L
634	Assuming Lognormal Distribution											
635					95% H-UCL	404.7				90% Chebyshev (MVUE) UCL		240.1
636					95% Chebyshev (MVUE) UCL	297.6				97.5% Chebyshev (MVUE) UCL		377.5
637					99% Chebyshev (MVUE) UCL	534.4						
638												
639	Nonparametric Distribution Free UCL Statistics											
640	Data appear to follow a Discernible Distribution at 5% Significance Level											
641												
642	Nonparametric Distribution Free UCLs											
643					95% CLT UCL	170.2				95% Jackknife UCL		175.5
644					95% Standard Bootstrap UCL	167.2				95% Bootstrap-t UCL		209.5
645					95% Hall's Bootstrap UCL	167.2				95% Percentile Bootstrap UCL		169.2
646					95% BCA Bootstrap UCL	185.4						
647					90% Chebyshev(Mean, Sd) UCL	218.1				95% Chebyshev(Mean, Sd) UCL		266.2
648					97.5% Chebyshev(Mean, Sd) UCL	333				99% Chebyshev(Mean, Sd) UCL		464.1
649												
650	Suggested UCL to Use											
651					95% Student's-t UCL	175.5						
652												
653	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
654	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
655	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
656	For additional insight the user may want to consult a statistician.											
657												
658												
659	Uranium-235											
660												
661	General Statistics											
662					Total Number of Observations	12				Number of Distinct Observations		1
663										Number of Missing Observations		0
664					Minimum	0.46				Mean		0.46
665					Maximum	0.46				Median		0.46
666												
667	Warning: There is only one distinct observation value in this data set - resulting in '0' variance!											
668	ProUCL (or any other software) should not be used on such a data set!											
669	The data set for variable Uranium-235 was not processed!											
670												
671	If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.											
672	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
673												
674												
675												

	A	B	C	D	E	F	G	H	I	J	K	L
676	Uranium-238											
677												
678						General Statistics						
679					Total Number of Observations	12				Number of Distinct Observations		1
680										Number of Missing Observations		0
681					Minimum	10.3				Mean		10.3
682					Maximum	10.3				Median		10.3
683												
684						Warning: There is only one distinct observation value in this data set - resulting in '0' variance!						
685						ProUCL (or any other software) should not be used on such a data set!						
686						The data set for variable Uranium-238 was not processed!						
687												
688						If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.						
689						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
690												
691												
692												

	A	B	C	D	E	F	G	H	I	J	K	L
693	Zinc											
694												
695					General Statistics							
696					Total Number of Observations	12				Number of Distinct Observations		12
697										Number of Missing Observations		0
698					Minimum	37.22				Mean		430.9
699					Maximum	3169				Median		217.6
700					SD	868.6				Std. Error of Mean		250.7
701					Coefficient of Variation	2.016				Skewness		3.372
702												
703					Normal GOF Test							
704					Shapiro Wilk Test Statistic	0.439				Shapiro Wilk GOF Test		
705					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
706					Lilliefors Test Statistic	0.454				Lilliefors GOF Test		
707					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
708					Data Not Normal at 5% Significance Level							
709												
710					Assuming Normal Distribution							
711					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
712					95% Student's-t UCL	881.2				95% Adjusted-CLT UCL (Chen-1995)		1104
713										95% Modified-t UCL (Johnson-1978)		921.9
714												
715					Gamma GOF Test							
716					A-D Test Statistic	1.241				Anderson-Darling Gamma GOF Test		
717					5% A-D Critical Value	0.769				Data Not Gamma Distributed at 5% Significance Level		
718					K-S Test Statistic	0.324				Kolmogrov-Smirnoff Gamma GOF Test		
719					5% K-S Critical Value	0.255				Data Not Gamma Distributed at 5% Significance Level		
720					Data Not Gamma Distributed at 5% Significance Level							
721												
722					Gamma Statistics							
723					k hat (MLE)	0.708				k star (bias corrected MLE)		0.586
724					Theta hat (MLE)	609				Theta star (bias corrected MLE)		735.1
725					nu hat (MLE)	16.98				nu star (bias corrected)		14.07
726					MLE Mean (bias corrected)	430.9				MLE Sd (bias corrected)		562.8
727										Approximate Chi Square Value (0.05)		6.619
728					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		5.856
729												
730					Assuming Gamma Distribution							
731					95% Approximate Gamma UCL (use when n>=50))	916				95% Adjusted Gamma UCL (use when n<50)		1035
732												
733					Lognormal GOF Test							
734					Shapiro Wilk Test Statistic	0.891				Shapiro Wilk Lognormal GOF Test		
735					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
736					Lilliefors Test Statistic	0.212				Lilliefors Lognormal GOF Test		
737					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
738					Data appear Lognormal at 5% Significance Level							
739												
740					Lognormal Statistics							
741					Minimum of Logged Data	3.617				Mean of logged Data		5.213
742					Maximum of Logged Data	8.061				SD of logged Data		1.192
743												

	A	B	C	D	E	F	G	H	I	J	K	L
744	**Assuming Lognormal Distribution**											
745					95% H-UCL	1212			90% Chebyshev (MVUE) UCL			724.5
746				95% Chebyshev (MVUE) UCL		897.7			97.5% Chebyshev (MVUE) UCL			1138
747				99% Chebyshev (MVUE) UCL		1610						
748												
749	**Nonparametric Distribution Free UCL Statistics**											
750	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
751												
752	**Nonparametric Distribution Free UCLs**											
753					95% CLT UCL	843.4			95% Jackknife UCL			881.2
754				95% Standard Bootstrap UCL		818.9			95% Bootstrap-t UCL			2928
755				95% Hall's Bootstrap UCL		2990			95% Percentile Bootstrap UCL			919.1
756				95% BCA Bootstrap UCL		1190						
757				90% Chebyshev(Mean, Sd) UCL		1183			95% Chebyshev(Mean, Sd) UCL			1524
758				97.5% Chebyshev(Mean, Sd) UCL		1997			99% Chebyshev(Mean, Sd) UCL			2926
759												
760	**Suggested UCL to Use**											
761				95% Chebyshev (Mean, Sd) UCL		1524						
762												
763	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
764	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
765	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
766	For additional insight the user may want to consult a statistician.											
767												