	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			3/10/2015 11:12:12 AM								
5	From File			EPC_080SurfR2.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	**Chromium**											
12												
13	**General Statistics**											
14	Total Number of Observations					12	Number of Distinct Observations					3
15							Number of Missing Observations					0
16	Minimum					12	Mean					14.31
17	Maximum					37.7	Median					12
18	SD					7.389	Std. Error of Mean					2.133
19	Coefficient of Variation					0.516	Skewness					3.428
20												
21	**Normal GOF Test**											
22	Shapiro Wilk Test Statistic					0.362	**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.456	**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value					0.256	Data Not Normal at 5% Significance Level					
26	**Data Not 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					18.14	95% Adjusted-CLT UCL (Chen-1995)					20.07
31							95% Modified-t UCL (Johnson-1978)					18.49
32												
33	**Gamma GOF Test**											
34	A-D Test Statistic					3.645	**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value					0.731	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.469	**Kolmogrov-Smirnoff Gamma GOF Test**					
37	5% K-S Critical Value					0.246	Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**											
39												
40	**Gamma Statistics**											
41	k hat (MLE)					7.549	k star (bias corrected MLE)					5.717
42	Theta hat (MLE)					1.895	Theta star (bias corrected MLE)					2.503
43	nu hat (MLE)					181.2	nu star (bias corrected)					137.2
44	MLE Mean (bias corrected)					14.31	MLE Sd (bias corrected)					5.984
45							Approximate Chi Square Value (0.05)					111.2
46	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					107.6
47												
48	**Assuming Gamma Distribution**											
49	95% Approximate Gamma UCL (use when n>=50))					17.66	95% Adjusted Gamma UCL (use when n<50)					18.25
50												
51	**Lognormal GOF Test**											
52	Shapiro Wilk Test Statistic					0.385	**Shapiro Wilk Lognormal GOF Test**					

	A	B	C	D	E	F	G	H	I	J	K	L
53					5% Shapiro Wilk Critical Value	0.859		Data Not Lognormal at 5% Significance Level				
54					Lilliefors Test Statistic	0.462		**Lilliefors Lognormal GOF Test**				
55					5% Lilliefors Critical Value	0.256		Data Not Lognormal at 5% Significance Level				
56					**Data Not Lognormal at 5% Significance Level**							
57												
58					**Lognormal Statistics**							
59					Minimum of Logged Data	2.485				Mean of logged Data		2.593
60					Maximum of Logged Data	3.63				SD of logged Data		0.329
61												
62					**Assuming Lognormal Distribution**							
63					95% H-UCL	17.14				90% Chebyshev (MVUE) UCL		18.1
64					95% Chebyshev (MVUE) UCL	19.94				97.5% Chebyshev (MVUE) UCL		22.49
65					99% Chebyshev (MVUE) UCL	27.49						
66												
67					**Nonparametric Distribution Free UCL Statistics**							
68					**Data do not follow a Discernible Distribution (0.05)**							
69												
70					**Nonparametric Distribution Free UCLs**							
71					95% CLT UCL	17.82				95% Jackknife UCL		18.14
72					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
73					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
74					95% BCA Bootstrap UCL	N/A						
75					90% Chebyshev(Mean, Sd) UCL	20.71				95% Chebyshev(Mean, Sd) UCL		23.61
76					97.5% Chebyshev(Mean, Sd) UCL	27.63				99% Chebyshev(Mean, Sd) UCL		35.53
77												
78					**Suggested UCL to Use**							
79					95% Student's-t UCL	18.14				or 95% Modified-t UCL		18.49
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												
87	Iron											
88												
89					**General Statistics**							
90					Total Number of Observations	12				Number of Distinct Observations		12
91										Number of Missing Observations		0
92					Minimum	15151				Mean		27146
93					Maximum	41269				Median		26944
94					SD	6451				Std. Error of Mean		1862
95					Coefficient of Variation	0.238				Skewness		0.539
96												
97					**Normal GOF Test**							
98					Shapiro Wilk Test Statistic	0.922		**Shapiro Wilk GOF Test**				
99					5% Shapiro Wilk Critical Value	0.859		Data appear Normal at 5% Significance Level				
100					Lilliefors Test Statistic	0.254		**Lilliefors GOF Test**				
101					5% Lilliefors Critical Value	0.256		Data appear Normal at 5% Significance Level				
102					**Data appear Normal at 5% Significance Level**							
103												
104					**Assuming Normal Distribution**							

	A	B	C	D	E	F	G	H	I	J	K	L
105	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
106					95% Student's-t UCL	30490				95% Adjusted-CLT UCL (Chen-1995)		30519
107										95% Modified-t UCL (Johnson-1978)		30539
108												
109	**Gamma GOF Test**											
110					A-D Test Statistic	0.523	**Anderson-Darling Gamma GOF Test**					
111					5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.223	**Kolmogrov-Smirnoff Gamma GOF Test**					
113					5% K-S Critical Value	0.245	Detected data appear Gamma Distributed at 5% Significance Level					
114	**Detected data appear Gamma Distributed at 5% Significance Level**											
115												
116	**Gamma Statistics**											
117					k hat (MLE)	19.01				k star (bias corrected MLE)		14.31
118					Theta hat (MLE)	1428				Theta star (bias corrected MLE)		1897
119					nu hat (MLE)	456.2				nu star (bias corrected)		343.5
120					MLE Mean (bias corrected)	27146				MLE Sd (bias corrected)		7176
121										Approximate Chi Square Value (0.05)		301.5
122					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		295.5
123												
124	**Assuming Gamma Distribution**											
125					95% Approximate Gamma UCL (use when n>=50))	30922				95% Adjusted Gamma UCL (use when n<50)		31550
126												
127	**Lognormal GOF Test**											
128					Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk Lognormal GOF Test**					
129					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.216	**Lilliefors Lognormal GOF Test**					
131					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
132	**Data appear Lognormal at 5% Significance Level**											
133												
134	**Lognormal Statistics**											
135					Minimum of Logged Data	9.626				Mean of logged Data		10.18
136					Maximum of Logged Data	10.63				SD of logged Data		0.245
137												
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	31284				90% Chebyshev (MVUE) UCL		32958
140					95% Chebyshev (MVUE) UCL	35580				97.5% Chebyshev (MVUE) UCL		39220
141					99% Chebyshev (MVUE) UCL	46370						
142												
143	**Nonparametric Distribution Free UCL Statistics**											
144	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
145												
146	**Nonparametric Distribution Free UCLs**											
147					95% CLT UCL	30209				95% Jackknife UCL		30490
148					95% Standard Bootstrap UCL	29972				95% Bootstrap-t UCL		30997
149					95% Hall's Bootstrap UCL	33436				95% Percentile Bootstrap UCL		30271
150					95% BCA Bootstrap UCL	30278						
151					90% Chebyshev(Mean, Sd) UCL	32733				95% Chebyshev(Mean, Sd) UCL		35263
152					97.5% Chebyshev(Mean, Sd) UCL	38776				99% Chebyshev(Mean, Sd) UCL		45676
153												
154	**Suggested UCL to Use**											
155					95% Student's-t UCL	30490						
156												

	A	B	C	D	E	F	G	H	I	J	K	L
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
159	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
160	For additional insight the user may want to consult a statistician.											
161												
162												
163	**Manganese**											
164												
165	**General Statistics**											
166	Total Number of Observations					12	Number of Distinct Observations					12
167							Number of Missing Observations					0
168	Minimum					198.4	Mean					641.7
169	Maximum					2066	Median					502.5
170	SD					480.3	Std. Error of Mean					138.7
171	Coefficient of Variation					0.749	Skewness					2.707
172												
173	**Normal GOF Test**											
174	Shapiro Wilk Test Statistic					0.67	**Shapiro Wilk GOF Test**					
175	5% Shapiro Wilk Critical Value					0.859	Data Not Normal at 5% Significance Level					
176	Lilliefors Test Statistic					0.287	**Lilliefors GOF Test**					
177	5% Lilliefors Critical Value					0.256	Data Not Normal at 5% Significance Level					
178	**Data Not Normal at 5% Significance Level**											
179												
180	**Assuming Normal Distribution**											
181	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
182	95% Student's-t UCL					890.7	95% Adjusted-CLT UCL (Chen-1995)					985.6
183							95% Modified-t UCL (Johnson-1978)					908.8
184												
185	**Gamma GOF Test**											
186	A-D Test Statistic					0.736	**Anderson-Darling Gamma GOF Test**					
187	5% A-D Critical Value					0.739	Detected data appear Gamma Distributed at 5% Significance Level					
188	K-S Test Statistic					0.221	**Kolmogrov-Smirnoff Gamma GOF Test**					
189	5% K-S Critical Value					0.247	Detected data appear Gamma Distributed at 5% Significance Level					
190	**Detected data appear Gamma Distributed at 5% Significance Level**											
191												
192	**Gamma Statistics**											
193	k hat (MLE)					3.141	k star (bias corrected MLE)					2.412
194	Theta hat (MLE)					204.3	Theta star (bias corrected MLE)					266.1
195	nu hat (MLE)					75.39	nu star (bias corrected)					57.88
196	MLE Mean (bias corrected)					641.7	MLE Sd (bias corrected)					413.2
197							Approximate Chi Square Value (0.05)					41.39
198	Adjusted Level of Significance					0.029	Adjusted Chi Square Value					39.27
199												
200	**Assuming Gamma Distribution**											
201	95% Approximate Gamma UCL (use when n>=50)					897.4	95% Adjusted Gamma UCL (use when n<50)					945.8
202												
203	**Lognormal GOF Test**											
204	Shapiro Wilk Test Statistic					0.92	**Shapiro Wilk Lognormal GOF Test**					
205	5% Shapiro Wilk Critical Value					0.859	Data appear Lognormal at 5% Significance Level					
206	Lilliefors Test Statistic					0.183	**Lilliefors Lognormal GOF Test**					
207	5% Lilliefors Critical Value					0.256	Data appear Lognormal at 5% Significance Level					
208	**Data appear Lognormal at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
209												
210						Lognormal Statistics						
211					Minimum of Logged Data	5.29				Mean of logged Data		6.297
212					Maximum of Logged Data	7.633				SD of logged Data		0.563
213												
214						Assuming Lognormal Distribution						
215					95% H-UCL	927.2				90% Chebyshev (MVUE) UCL		941
216					95% Chebyshev (MVUE) UCL	1083				97.5% Chebyshev (MVUE) UCL		1281
217					99% Chebyshev (MVUE) UCL	1669						
218												
219						Nonparametric Distribution Free UCL Statistics						
220						Data appear to follow a Discernible Distribution at 5% Significance Level						
221												
222						Nonparametric Distribution Free UCLs						
223					95% CLT UCL	869.8				95% Jackknife UCL		890.7
224					95% Standard Bootstrap UCL	858.1				95% Bootstrap-t UCL		1236
225					95% Hall's Bootstrap UCL	1817				95% Percentile Bootstrap UCL		882.1
226					95% BCA Bootstrap UCL	1016						
227					90% Chebyshev(Mean, Sd) UCL	1058				95% Chebyshev(Mean, Sd) UCL		1246
228					97.5% Chebyshev(Mean, Sd) UCL	1508				99% Chebyshev(Mean, Sd) UCL		2021
229												
230						Suggested UCL to Use						
231					95% Adjusted Gamma UCL	945.8						
232												
233					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
234					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
235					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
236					For additional insight the user may want to consult a statistician.							
237												
238												
239	Molybdenum											
240												
241						General Statistics						
242					Total Number of Observations	12				Number of Distinct Observations		4
243										Number of Missing Observations		0
244					Minimum	0.55				Mean		7.379
245					Maximum	46				Median		3
246					SD	12.68				Std. Error of Mean		3.661
247					Coefficient of Variation	1.718				Skewness		3.048
248												
249						Normal GOF Test						
250					Shapiro Wilk Test Statistic	0.471				Shapiro Wilk GOF Test		
251					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
252					Lilliefors Test Statistic	0.468				Lilliefors GOF Test		
253					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
254						Data Not Normal at 5% Significance Level						
255												
256						Assuming Normal Distribution						
257					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
258					95% Student's-t UCL	13.95				95% Adjusted-CLT UCL (Chen-1995)		16.84
259										95% Modified-t UCL (Johnson-1978)		14.49
260												

	A	B	C	D	E	F	G	H	I	J	K	L
261	Gamma GOF Test											
262					A-D Test Statistic	2.376	Anderson-Darling Gamma GOF Test					
263					5% A-D Critical Value	0.762	Data Not Gamma Distributed at 5% Significance Level					
264					K-S Test Statistic	0.469	Kolmogrov-Smirnoff Gamma GOF Test					
265					5% K-S Critical Value	0.254	Data Not Gamma Distributed at 5% Significance Level					
266	Data Not Gamma Distributed at 5% Significance Level											
267												
268	Gamma Statistics											
269					k hat (MLE)	0.864	k star (bias corrected MLE)					0.704
270					Theta hat (MLE)	8.537	Theta star (bias corrected MLE)					10.48
271					nu hat (MLE)	20.74	nu star (bias corrected)					16.89
272					MLE Mean (bias corrected)	7.379	MLE Sd (bias corrected)					8.796
273							Approximate Chi Square Value (0.05)					8.595
274					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					7.707
275												
276	Assuming Gamma Distribution											
277					95% Approximate Gamma UCL (use when n>=50))	14.5	95% Adjusted Gamma UCL (use when n<50)					16.17
278												
279	Lognormal GOF Test											
280					Shapiro Wilk Test Statistic	0.709	Shapiro Wilk Lognormal GOF Test					
281					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
282					Lilliefors Test Statistic	0.416	Lilliefors Lognormal GOF Test					
283					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
284	Data Not Lognormal at 5% Significance Level											
285												
286	Lognormal Statistics											
287					Minimum of Logged Data	-0.598	Mean of logged Data					1.319
288					Maximum of Logged Data	3.829	SD of logged Data					1.059
289												
290	Assuming Lognormal Distribution											
291					95% H-UCL	17.2	90% Chebyshev (MVUE) UCL					12.18
292					95% Chebyshev (MVUE) UCL	14.92	97.5% Chebyshev (MVUE) UCL					18.72
293					99% Chebyshev (MVUE) UCL	26.19						
294												
295	Nonparametric Distribution Free UCL Statistics											
296	Data do not follow a Discernible Distribution (0.05)											
297												
298	Nonparametric Distribution Free UCLs											
299					95% CLT UCL	13.4	95% Jackknife UCL					13.95
300					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
301					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
302					95% BCA Bootstrap UCL	N/A						
303					90% Chebyshev(Mean, Sd) UCL	18.36	95% Chebyshev(Mean, Sd) UCL					23.34
304					97.5% Chebyshev(Mean, Sd) UCL	30.24	99% Chebyshev(Mean, Sd) UCL					43.8
305												
306	Suggested UCL to Use											
307					95% Chebyshev (Mean, Sd) UCL	23.34						
308												
309	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
310	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
311	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
312	For additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
313												
314												
315	PCB, Total											
316												
317						General Statistics						
318					Total Number of Observations	12				Number of Distinct Observations		10
319										Number of Missing Observations		0
320					Minimum	0.019				Mean		46.65
321					Maximum	475				Median		5
322					SD	135.6				Std. Error of Mean		39.14
323					Coefficient of Variation	2.907				Skewness		3.403
324												
325						Normal GOF Test						
326					Shapiro Wilk Test Statistic	0.39				Shapiro Wilk GOF Test		
327					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
328					Lilliefors Test Statistic	0.44				Lilliefors GOF Test		
329					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
330						Data Not Normal at 5% Significance Level						
331												
332						Assuming Normal Distribution						
333					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
334					95% Student's-t UCL	117				95% Adjusted-CLT UCL (Chen-1995)		152.1
335										95% Modified-t UCL (Johnson-1978)		123.4
336												
337						Gamma GOF Test						
338					A-D Test Statistic	0.883				Anderson-Darling Gamma GOF Test		
339					5% A-D Critical Value	0.862				Data Not Gamma Distributed at 5% Significance Level		
340					K-S Test Statistic	0.28				Kolmogrov-Smirnoff Gamma GOF Test		
341					5% K-S Critical Value	0.271				Data Not Gamma Distributed at 5% Significance Level		
342						Data Not Gamma Distributed at 5% Significance Level						
343												
344						Gamma Statistics						
345					k hat (MLE)	0.221				k star (bias corrected MLE)		0.221
346					Theta hat (MLE)	211.2				Theta star (bias corrected MLE)		210.9
347					nu hat (MLE)	5.302				nu star (bias corrected)		5.31
348					MLE Mean (bias corrected)	46.65				MLE Sd (bias corrected)		99.19
349										Approximate Chi Square Value (0.05)		1.298
350					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		1.023
351												
352						Assuming Gamma Distribution						
353					95% Approximate Gamma UCL (use when n>=50))	190.9				95% Adjusted Gamma UCL (use when n<50)		242.2
354												
355						Lognormal GOF Test						
356					Shapiro Wilk Test Statistic	0.942				Shapiro Wilk Lognormal GOF Test		
357					5% Shapiro Wilk Critical Value	0.859				Data appear Lognormal at 5% Significance Level		
358					Lilliefors Test Statistic	0.216				Lilliefors Lognormal GOF Test		
359					5% Lilliefors Critical Value	0.256				Data appear Lognormal at 5% Significance Level		
360						Data appear Lognormal at 5% Significance Level						
361												
362						Lognormal Statistics						
363					Minimum of Logged Data	-3.963				Mean of logged Data		0.563
364					Maximum of Logged Data	6.163				SD of logged Data		3.08

	A	B	C	D	E	F	G	H	I	J	K	L
365												
366					Assuming Lognormal Distribution							
367					95% H-UCL	190007			90% Chebyshev (MVUE) UCL			202.5
368				95% Chebyshev (MVUE) UCL		268.4			97.5% Chebyshev (MVUE) UCL			359.8
369				99% Chebyshev (MVUE) UCL		539.5						
370												
371					Nonparametric Distribution Free UCL Statistics							
372					Data appear to follow a Discernible Distribution at 5% Significance Level							
373												
374					Nonparametric Distribution Free UCLs							
375					95% CLT UCL	111			95% Jackknife UCL			117
376				95% Standard Bootstrap UCL		108.2			95% Bootstrap-t UCL			1633
377				95% Hall's Bootstrap UCL		566			95% Percentile Bootstrap UCL			123.8
378				95% BCA Bootstrap UCL		164.9						
379				90% Chebyshev(Mean, Sd) UCL		164.1			95% Chebyshev(Mean, Sd) UCL			217.3
380				97.5% Chebyshev(Mean, Sd) UCL		291.1			99% Chebyshev(Mean, Sd) UCL			436.1
381												
382					Suggested UCL to Use							
383				95% Hall's Bootstrap UCL		566						
384												
385					Recommended UCL exceeds the maximum observation							
386												
387					In Case Bootstrap t and/or Hall's Bootstrap yields an unreasonably large UCL value, use 97.5% or 99% Chebyshev (Mean, Sd) UCL							
388												
389					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
390					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
391					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
392					For additional insight the user may want to consult a statistician.							
393												
394												
395	Uranium											
396												
397					General Statistics							
398				Total Number of Observations		12			Number of Distinct Observations			5
399									Number of Missing Observations			0
400				Minimum		4.5			Mean			25.6
401				Maximum		108			Median			10
402				SD		37.83			Std. Error of Mean			10.92
403				Coefficient of Variation		1.478			Skewness			2.048
404												
405					Normal GOF Test							
406				Shapiro Wilk Test Statistic		0.496			Shapiro Wilk GOF Test			
407				5% Shapiro Wilk Critical Value		0.859			Data Not Normal at 5% Significance Level			
408				Lilliefors Test Statistic		0.493			Lilliefors GOF Test			
409				5% Lilliefors Critical Value		0.256			Data Not Normal at 5% Significance Level			
410					Data Not Normal at 5% Significance Level							
411												
412					Assuming Normal Distribution							
413				95% Normal UCL					95% UCLs (Adjusted for Skewness)			
414				95% Student's-t UCL		45.21			95% Adjusted-CLT UCL (Chen-1995)			50.46
415									95% Modified-t UCL (Johnson-1978)			46.28
416												

	A	B	C	D	E	F	G	H	I	J	K	L
417	**Gamma GOF Test**											
418					A-D Test Statistic	2.897	**Anderson-Darling Gamma GOF Test**					
419					5% A-D Critical Value	0.759	Data Not Gamma Distributed at 5% Significance Level					
420					K-S Test Statistic	0.498	**Kolmogrov-Smirnoff Gamma GOF Test**					
421					5% K-S Critical Value	0.253	Data Not Gamma Distributed at 5% Significance Level					
422	**Data Not Gamma Distributed at 5% Significance Level**											
423												
424	**Gamma Statistics**											
425					k hat (MLE)	0.945	k star (bias corrected MLE)					0.764
426					Theta hat (MLE)	27.09	Theta star (bias corrected MLE)					33.5
427					nu hat (MLE)	22.68	nu star (bias corrected)					18.34
428					MLE Mean (bias corrected)	25.6	MLE Sd (bias corrected)					29.28
429							Approximate Chi Square Value (0.05)					9.637
430					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					8.69
431												
432	**Assuming Gamma Distribution**											
433					95% Approximate Gamma UCL (use when n>=50))	48.71	95% Adjusted Gamma UCL (use when n<50)					54.03
434												
435	**Lognormal GOF Test**											
436					Shapiro Wilk Test Statistic	0.608	**Shapiro Wilk Lognormal GOF Test**					
437					5% Shapiro Wilk Critical Value	0.859	Data Not Lognormal at 5% Significance Level					
438					Lilliefors Test Statistic	0.463	**Lilliefors Lognormal GOF Test**					
439					5% Lilliefors Critical Value	0.256	Data Not Lognormal at 5% Significance Level					
440	**Data Not Lognormal at 5% Significance Level**											
441												
442	**Lognormal Statistics**											
443					Minimum of Logged Data	1.504	Mean of logged Data					2.627
444					Maximum of Logged Data	4.682	SD of logged Data					0.98
445												
446	**Assuming Lognormal Distribution**											
447					95% H-UCL	52.36	90% Chebyshev (MVUE) UCL					40.4
448					95% Chebyshev (MVUE) UCL	49.1	97.5% Chebyshev (MVUE) UCL					61.17
449					99% Chebyshev (MVUE) UCL	84.89						
450												
451	**Nonparametric Distribution Free UCL Statistics**											
452	**Data do not follow a Discernible Distribution (0.05)**											
453												
454	**Nonparametric Distribution Free UCLs**											
455					95% CLT UCL	43.56	95% Jackknife UCL					45.21
456					95% Standard Bootstrap UCL	42.68	95% Bootstrap-t UCL					410.2
457					95% Hall's Bootstrap UCL	670.9	95% Percentile Bootstrap UCL					42.18
458					95% BCA Bootstrap UCL	49.63						
459					90% Chebyshev(Mean, Sd) UCL	58.36	95% Chebyshev(Mean, Sd) UCL					73.2
460					97.5% Chebyshev(Mean, Sd) UCL	93.79	99% Chebyshev(Mean, Sd) UCL					134.2
461												
462	**Suggested UCL to Use**											
463					95% Chebyshev (Mean, Sd) UCL	73.2						
464												
465	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
466	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
467	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
468	For additional insight the user may want to consult a statistician.											

	A	B	C	D	E	F	G	H	I	J	K	L
469												
470												
471	Uranium-238											
472												
473						General Statistics						
474					Total Number of Observations	12				Number of Distinct Observations		1
475										Number of Missing Observations		0
476					Minimum	1.59				Mean		1.59
477					Maximum	1.59				Median		1.59
478												
479						Warning: There is only one distinct observation value in this data set - resulting in '0' variance!						
480						ProUCL (or any other software) should not be used on such a data set!						
481						The data set for variable Uranium-238 was not processed!						
482												
483						If possible, compute and collect Data Quality Objectives (DQOs) based sample size and analytical results.						
484						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
485												
486												
487												
488	Vanadium											
489												
490						General Statistics						
491					Total Number of Observations	12				Number of Distinct Observations		12
492										Number of Missing Observations		0
493					Minimum	70				Mean		109.8
494					Maximum	138				Median		117
495					SD	21.18				Std. Error of Mean		6.114
496					Coefficient of Variation	0.193				Skewness		-0.492
497												
498						Normal GOF Test						
499					Shapiro Wilk Test Statistic	0.948				Shapiro Wilk GOF Test		
500					5% Shapiro Wilk Critical Value	0.859				Data appear Normal at 5% Significance Level		
501					Lilliefors Test Statistic	0.199				Lilliefors GOF Test		
502					5% Lilliefors Critical Value	0.256				Data appear Normal at 5% Significance Level		
503						Data appear Normal at 5% Significance Level						
504												
505						Assuming Normal Distribution						
506					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
507					95% Student's-t UCL	120.7				95% Adjusted-CLT UCL (Chen-1995)		118.9
508										95% Modified-t UCL (Johnson-1978)		120.6
509												
510						Gamma GOF Test						
511					A-D Test Statistic	0.383				Anderson-Darling Gamma GOF Test		
512					5% A-D Critical Value	0.731				Detected data appear Gamma Distributed at 5% Significance Level		
513					K-S Test Statistic	0.222				Kolmogrov-Smirnoff Gamma GOF Test		
514					5% K-S Critical Value	0.245				Detected data appear Gamma Distributed at 5% Significance Level		
515						Detected data appear Gamma Distributed at 5% Significance Level						
516												
517						Gamma Statistics						
518					k hat (MLE)	26.82				k star (bias corrected MLE)		20.17
519					Theta hat (MLE)	4.092				Theta star (bias corrected MLE)		5.441
520					nu hat (MLE)	643.8				nu star (bias corrected)		484.1

	A	B	C	D	E	F	G	H	I	J	K	L
521					MLE Mean (bias corrected)	109.8					MLE Sd (bias corrected)	24.44
522											Approximate Chi Square Value (0.05)	434.1
523					Adjusted Level of Significance	0.029					Adjusted Chi Square Value	426.9
524												
525					Assuming Gamma Distribution							
526				95% Approximate Gamma UCL (use when n>=50))		122.4					95% Adjusted Gamma UCL (use when n<50)	124.5
527												
528					Lognormal GOF Test							
529					Shapiro Wilk Test Statistic	0.923			Shapiro Wilk Lognormal GOF Test			
530					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
531					Lilliefors Test Statistic	0.223			Lilliefors Lognormal GOF Test			
532					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
533					Data appear Lognormal at 5% Significance Level							
534												
535					Lognormal Statistics							
536					Minimum of Logged Data	4.248					Mean of logged Data	4.679
537					Maximum of Logged Data	4.927					SD of logged Data	0.208
538												
539					Assuming Lognormal Distribution							
540					95% H-UCL	123.6					90% Chebyshev (MVUE) UCL	129.7
541					95% Chebyshev (MVUE) UCL	138.7					97.5% Chebyshev (MVUE) UCL	151.1
542					99% Chebyshev (MVUE) UCL	175.6						
543												
544					Nonparametric Distribution Free UCL Statistics							
545					Data appear to follow a Discernible Distribution at 5% Significance Level							
546												
547					Nonparametric Distribution Free UCLs							
548					95% CLT UCL	119.8					95% Jackknife UCL	120.7
549					95% Standard Bootstrap UCL	119.6					95% Bootstrap-t UCL	119.7
550					95% Hall's Bootstrap UCL	118.8					95% Percentile Bootstrap UCL	119.6
551					95% BCA Bootstrap UCL	118.3						
552					90% Chebyshev(Mean, Sd) UCL	128.1					95% Chebyshev(Mean, Sd) UCL	136.4
553					97.5% Chebyshev(Mean, Sd) UCL	147.9					99% Chebyshev(Mean, Sd) UCL	170.6
554												
555					Suggested UCL to Use							
556					95% Student's-t UCL	120.7						
557												
558	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
559	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
560	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
561	For additional insight the user may want to consult a statistician.											
562												
563	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
564	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
565												