

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	e/Time of Computation			8/13/2015 2:39:02 PM								
5	From File			ProUCLinput_36-008_0-1.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	f Bootstrap Operations			2000								
9												
10	Acenaphthene											
11												
12	General Statistics											
13	Total Number of Observations					57	Number of Distinct Observations					56
14	Number of Detects					14	Number of Non-Detects					43
15	Number of Distinct Detects					14	Number of Distinct Non-Detects					42
16	Minimum Detect					0.01	Minimum Non-Detect					0.03
17	Maximum Detect					3.43	Maximum Non-Detect					1.81
18	Variance Detects					0.81	Percent Non-Detects					75.4
19	Mean Detects					0.51	SD Detects					0.90
20	Median Detects					0.10	CV Detects					1.74
21	Skewness Detects					2.94	Kurtosis Detects					9.54
22	Mean of Logged Detects					-1.78	SD of Logged Detects					1.58
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic					0.58	Shapiro Wilk GOF Test					
26	5% Shapiro Wilk Critical Value					0.87	Detected Data Not Normal at 5% Significance Level					
27	Lilliefors Test Statistic					0.28	Lilliefors GOF Test					
28	5% Lilliefors Critical Value					0.23	Detected Data Not Normal at 5% Significance Level					
29	Detected Data Not Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	Mean					0.14	Standard Error of Mean					0.06
33	SD					0.48	95% KM (BCA) UCL					0.28
34	95% KM (t) UCL					0.26	95% KM (Percentile Bootstrap) UCL					0.27
35	95% KM (z) UCL					0.25	95% KM Bootstrap t UCL					0.46
36	90% KM Chebyshev UCL					0.34	95% KM Chebyshev UCL					0.43
37	97.5% KM Chebyshev UCL					0.56	99% KM Chebyshev UCL					0.80
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic					0.63	Anderson-Darling GOF Test					
41	5% A-D Critical Value					0.78	data appear Gamma Distributed at 5% Significance Level					
42	K-S Test Statistic					0.22	Kolmogorov-Smirnoff GOF					
43	5% K-S Critical Value					0.24	data appear Gamma Distributed at 5% Significance Level					
44	Detected data appear Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)					0.55	k star (bias corrected MLE)					0.48
48	Theta hat (MLE)					0.92	Theta star (bias corrected MLE)					1.06
49	nu hat (MLE)					15.6	nu star (bias corrected)					13.6
50	MLE Mean (bias corrected)					0.51	MLE Sd (bias corrected)					0.74
51												
52	Gamma Kaplan-Meier (KM) Statistics											
53	k hat (KM)					0.09	nu hat (KM)					11
54	Approximate Chi Square Value (11.00, α)					4.57	Adjusted Chi Square Value (11.00, β)					4.46
55	Approximate KM-UCL (use when $n \geq 50$)					0.35	Gamma Adjusted KM-UCL (use when $n < 50$)					0.36
56	Gamma (KM) may not be used when k hat (KM) is < 0.1											
57												
58	Gamma ROS Statistics using Imputed Non-Detects											
59	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
60	GROS may not be used when kstar of detected data is small such as < 0.1											
61	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
62	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
63	Minimum					0.01	Mean					0.13
64	Maximum					3.43	Median					0.01
65	SD					0.48	CV					3.62
66	k hat (MLE)					0.35	k star (bias corrected MLE)					0.34
67	Theta hat (MLE)					0.38	Theta star (bias corrected MLE)					0.38
68	nu hat (MLE)					40.1	nu star (bias corrected)					39.4
69	MLE Mean (bias corrected)					0.13	MLE Sd (bias corrected)					0.22
70							Adjusted Level of Significance (β)					0.04
71	Approximate Chi Square Value (39.41, α)					26.0	Adjusted Chi Square Value (39.41, β)					25.7
72	Gamma Approximate UCL (use when $n \geq 50$)					0.20	Gamma Adjusted UCL (use when $n < 50$)					0.20
73												
74	Lognormal GOF Test on Detected Observations Only											
75	Shapiro Wilk Test Statistic					0.96	Shapiro Wilk GOF Test					
76	5% Shapiro Wilk Critical Value					0.87	Detected Data appear Lognormal at 5% Significance Level					
77	Lilliefors Test Statistic					0.15	Lilliefors GOF Test					
78	5% Lilliefors Critical Value					0.23	Detected Data appear Lognormal at 5% Significance Level					
79	Detected Data appear Lognormal at 5% Significance Level											
80												
81	Lognormal ROS Statistics Using Imputed Non-Detects											
82	Mean in Original Scale					0.14	Mean in Log Scale					-3.45

	A	B	C	D	E	F	G	H	I	J	K	L
83	SD in Original Scale					0.48	SD in Log Scale					1.23
84	95% t UCL (assumes normality of ROS data)					0.24	95% Percentile Bootstrap UCL					0.25
85	95% BCA Bootstrap UCL					0.33	95% Bootstrap t UCL					0.48
86	95% H-UCL (Log ROS)					0.10						
87												
88	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
89	KM Mean (logged)					-3.21	95% H-UCL (KM -Log)					0.12
90	KM SD (logged)					1.19	95% Critical H Value (KM-Log)					2.65
91	KM Standard Error of Mean (logged)					0.26						
92												
93	DL/2 Statistics											
94	DL/2 Normal						DL/2 Log-Transformed					
95	Mean in Original Scale					0.16	Mean in Log Scale					-3.09
96	SD in Original Scale					0.49	SD in Log Scale					1.24
97	95% t UCL (Assumes normality)					0.27	95% H-Stat UCL					0.15
98	DL/2 is not a recommended method, provided for comparisons and historical reasons											
99												
100	Nonparametric Distribution Free UCL Statistics											
101	Detected Data appear Gamma Distributed at 5% Significance Level											
102												
103	Suggested UCL to Use											
104	95% KM (t) UCL					0.26	95% GROS Approximate Gamma UCL					0.20
105	95% Approximate Gamma KM-UCL					0.35						
106												
107	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
108	Recommendations are based upon data size, data distribution, and skewness.											
109	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
110	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
111												
112	Acetone											
113												
114	General Statistics											
115	Total Number of Observations					57	Number of Distinct Observations					55
116	Number of Detects					9	Number of Non-Detects					48
117	Number of Distinct Detects					8	Number of Distinct Non-Detects					47
118	Minimum Detect					0.002	Minimum Non-Detect					0.003
119	Maximum Detect					0.039	Maximum Non-Detect					0.009
120	Variance Detects					1.5745E	Percent Non-Detects					84.2
121	Mean Detects					0.010	SD Detects					0.011
122	Median Detects					0.004	CV Detects					1.16
123	Skewness Detects					1.93	Kurtosis Detects					3.13
124	Mean of Logged Detects					-4.97	SD of Logged Detects					0.91
125												
126	Normal GOF Test on Detects Only											
127	Shapiro Wilk Test Statistic					0.67	Shapiro Wilk GOF Test					
128	5% Shapiro Wilk Critical Value					0.82	Detected Data Not Normal at 5% Significance Level					
129	Lilliefors Test Statistic					0.35	Lilliefors GOF Test					
130	5% Lilliefors Critical Value					0.29	Detected Data Not Normal at 5% Significance Level					
131	Detected Data Not Normal at 5% Significance Level											
132												
133	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
134	Mean					0.004	Standard Error of Mean					7.9488E
135	SD					0.005	95% KM (BCA) UCL					0.006
136	95% KM (t) UCL					0.005	95% KM (Percentile Bootstrap) UCL					0.006
137	95% KM (z) UCL					0.005	95% KM Bootstrap t UCL					0.007
138	90% KM Chebyshev UCL					0.007	95% KM Chebyshev UCL					0.008
139	97.5% KM Chebyshev UCL					0.009	99% KM Chebyshev UCL					0.011
140												
141	Gamma GOF Tests on Detected Observations Only											
142	A-D Test Statistic					1.03	Anderson-Darling GOF Test					
143	5% A-D Critical Value					0.73	Detected Data Not Gamma Distributed at 5% Significance Level					
144	K-S Test Statistic					0.35	Kolmogrov-Smirnoff GOF					
145	5% K-S Critical Value					0.28	Detected Data Not Gamma Distributed at 5% Significance Level					
146	Detected Data Not Gamma Distributed at 5% Significance Level											
147												
148	Gamma Statistics on Detected Data Only											
149	k hat (MLE)					1.26	k star (bias corrected MLE)					0.91
150	Theta hat (MLE)					0.008	Theta star (bias corrected MLE)					0.01
151	nu hat (MLE)					22.7	nu star (bias corrected)					16.5
152	MLE Mean (bias corrected)					0.010	MLE Sd (bias corrected)					0.011
153												
154	Gamma Kaplan-Meier (KM) Statistics											
155	k hat (KM)					0.72	nu hat (KM)					82.3
156	Approximate Chi Square Value (82.34, α)					62.4	Adjusted Chi Square Value (82.34, β)					61.9
157	Approximate KM-UCL (use when n>=50)					0.006	Gamma Adjusted KM-UCL (use when n<50)					0.006
158												
159	Gamma ROS Statistics using Imputed Non-Detects											
160	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
161	GROS may not be used when kstar of detected data is small such as < 0.1											
162	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
163	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
164	Minimum					0.002	Mean					0.011

	A	B	C	D	E	F	G	H	I	J	K	L
165					Maximum	0.03					Median	0.01
166					SD	0.004					CV	0.46
167					k hat (MLE)	7.24					k star (bias corrected MLE)	6.87
168					Theta hat (MLE)	0.001					Theta star (bias corrected MLE)	0.001
169					nu hat (MLE)	826.2					nu star (bias corrected)	784
170					MLE Mean (bias corrected)	0.01					MLE Sd (bias corrected)	0.003
171											Adjusted Level of Significance (β)	0.04
172					Approximate Chi Square Value (784.05, α)	720.1					Adjusted Chi Square Value (784.05, β)	718.5
173					Normal Approximate UCL (use when n>=50)	0.01					Gamma Adjusted UCL (use when n<50)	0.01
174												
175					Lognormal GOF Test on Detected Observations Only							
176					Shapiro Wilk Test Statistic	0.82					Shapiro Wilk GOF Test	
177					5% Shapiro Wilk Critical Value	0.82					Detected Data Not Lognormal at 5% Significance Level	
178					Lilliefors Test Statistic	0.32					Lilliefors GOF Test	
179					5% Lilliefors Critical Value	0.29					Detected Data Not Lognormal at 5% Significance Level	
180					Detected Data Not Lognormal at 5% Significance Level							
181												
182					Lognormal ROS Statistics Using Imputed Non-Detects							
183					Mean in Original Scale	0.004					Mean in Log Scale	-5.72
184					SD in Original Scale	0.005					SD in Log Scale	0.49
185					95% t UCL (assumes normality of ROS data)	0.005					95% Percentile Bootstrap UCL	0.005
186					95% BCA Bootstrap UCL	0.006					95% Bootstrap t UCL	0.01
187					95% H-UCL (Log ROS)	0.004						
188												
189					DL/2 Statistics							
190					DL/2 Normal						DL/2 Log-Transformed	
191					Mean in Original Scale	0.004					Mean in Log Scale	-5.64
192					SD in Original Scale	0.005					SD in Log Scale	0.50
193					95% t UCL (Assumes normality)	0.005					95% H-Stat UCL	0.004
194					DL/2 is not a recommended method, provided for comparisons and historical reasons							
195												
196					Nonparametric Distribution Free UCL Statistics							
197					Data do not follow a Discernible Distribution at 5% Significance Level							
198												
199					Suggested UCL to Use							
200					95% KM (t) UCL	0.005					95% KM (% Bootstrap) UCL	0.006
201												
202					Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate							
203					Recommendations are based upon data size, data distribution, and skewness.							
204					Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and							
205					Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult							
206												
207												
208					Aluminum							
209												
210					General Statistics							
211					Total Number of Observations	57					Number of Distinct Observations	57
212											Number of Missing Observations	0
213					Minimum	1680					Mean	5495
214					Maximum	14100					Median	5200
215					SD	2082					Std. Error of Mean	275.8
216					Coefficient of Variation	0.37					Skewness	1.30
217												
218					Normal GOF Test							
219					Shapiro Wilk Test Statistic	0.92					Shapiro Wilk GOF Test	
220					5% Shapiro Wilk P Value	0.001					Data Not Normal at 5% Significance Level	
221					Lilliefors Test Statistic	0.11					Lilliefors GOF Test	
222					5% Lilliefors Critical Value	0.11					Data appear Normal at 5% Significance Level	
223					Data appear Approximate Normal at 5% Significance Level							
224												
225					Assuming Normal Distribution							
226					95% Normal UCL						95% UCLs (Adjusted for Skewness)	
227					95% Student's-t UCL	5956					95% Adjusted-CLT UCL (Chen-1995)	6000
228											95% Modified-t UCL (Johnson-1978)	5964
229												
230					Gamma GOF Test							
231					A-D Test Statistic	0.60					Anderson-Darling Gamma GOF Test	
232					5% A-D Critical Value	0.75					Data appear Gamma Distributed at 5% Significance Level	
233					K-S Test Statistic	0.09					Kolmogorov-Smirnov Gamma GOF Test	
234					5% K-S Critical Value	0.11					Data appear Gamma Distributed at 5% Significance Level	
235					Detected data appear Gamma Distributed at 5% Significance Level							
236												
237					Gamma Statistics							
238					k hat (MLE)	7.27					k star (bias corrected MLE)	6.90
239					Theta hat (MLE)	755.4					Theta star (bias corrected MLE)	796
240					nu hat (MLE)	829.2					nu star (bias corrected)	786.9
241					MLE Mean (bias corrected)	5495					MLE Sd (bias corrected)	2091
242											Approximate Chi Square Value (0.05)	722.8
243					Adjusted Level of Significance	0.04					Adjusted Chi Square Value	721.2
244												
245					Assuming Gamma Distribution							
246					Approximate Gamma UCL (use when n>=50)	5982					Adjusted Gamma UCL (use when n<50)	5995

	A	B	C	D	E	F	G	H	I	J	K	L
247												
248	Lognormal GOF Test											
249	Shapiro Wilk Test Statistic			0.95	Shapiro Wilk Lognormal GOF Test							
250	5% Shapiro Wilk P Value			0.07	Data appear Lognormal at 5% Significance Level							
251	Lilliefors Test Statistic			0.11	Lilliefors Lognormal GOF Test							
252	5% Lilliefors Critical Value			0.11	Data appear Lognormal at 5% Significance Level							
253	Data appear Lognormal at 5% Significance Level											
254												
255	Lognormal Statistics											
256	Minimum of Logged Data			7.42	Mean of logged Data			8.54				
257	Maximum of Logged Data			9.55	SD of logged Data			0.39				
258												
259	Assuming Lognormal Distribution											
260	95% H-UCL			6072	90% Chebyshev (MVUE) UCL			6403				
261	95% Chebyshev (MVUE) UCL			6803	97.5% Chebyshev (MVUE) UCL			7358				
262	99% Chebyshev (MVUE) UCL			8449								
263												
264	Nonparametric Distribution Free UCL Statistics											
265	Data appear to follow a Discernible Distribution at 5% Significance Level											
266												
267	Nonparametric Distribution Free UCLs											
268	95% CLT UCL			5949	95% Jackknife UCL			5956				
269	95% Standard Bootstrap UCL			5945	95% Bootstrap-t UCL			6038				
270	95% Hall's Bootstrap UCL			6084	95% Percentile Bootstrap UCL			5936				
271	95% BCA Bootstrap UCL			5952								
272	90% Chebyshev(Mean, Sd) UCL			6322	95% Chebyshev(Mean, Sd) UCL			6697				
273	97.5% Chebyshev(Mean, Sd) UCL			7217	99% Chebyshev(Mean, Sd) UCL			8239				
274												
275	Suggested UCL to Use											
276	95% Student's-t UCL			5956								
277												
278	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
279	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
280	Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
281	For additional insight the user may want to consult a statistician.											
282												
283	Americium-241											
284												
285	General Statistics											
286	Total Number of Observations			57	Number of Distinct Observations			53				
287	Number of Detects			6	Number of Non-Detects			51				
288	Number of Distinct Detects			6	Number of Distinct Non-Detects			48				
289	Minimum Detect			0.014	Minimum Non-Detect			-0.001				
290	Maximum Detect			0.044	Maximum Non-Detect			0.024				
291	Variance Detects			1.3365E-05	Percent Non-Detects			89.41				
292	Mean Detects			0.024	SD Detects			0.011				
293	Median Detects			0.024	CV Detects			0.44				
294	Skewness Detects			1.37	Kurtosis Detects			1.36				
295												
296	Normal GOF Test on Detects Only											
297	Shapiro Wilk Test Statistic			0.83	Shapiro Wilk GOF Test							
298	5% Shapiro Wilk Critical Value			0.78	Detected Data appear Normal at 5% Significance Level							
299	Lilliefors Test Statistic			0.22	Lilliefors GOF Test							
300	5% Lilliefors Critical Value			0.36	Detected Data appear Normal at 5% Significance Level							
301	Detected Data appear Normal at 5% Significance Level											
302												
303	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
304	Mean			0.001	Standard Error of Mean			0.001				
305	SD			0.009	95% KM (BCA) UCL			0.005				
306	95% KM (t) UCL			0.003	95% KM (Percentile Bootstrap) UCL			0.004				
307	95% KM (z) UCL			0.003	95% KM Bootstrap t UCL			0.003				
308	90% KM Chebyshev UCL			0.005	95% KM Chebyshev UCL			0.007				
309	97.5% KM Chebyshev UCL			0.01	99% KM Chebyshev UCL			0.014				
310												
311	Gamma GOF Tests on Detected Observations Only											
312	A-D Test Statistic			0.43	Anderson-Darling GOF Test							
313	5% A-D Critical Value			0.69	Detected data appear Gamma Distributed at 5% Significance Level							
314	K-S Test Statistic			0.25	Kolmogrov-Smirnoff GOF							
315	5% K-S Critical Value			0.33	Detected data appear Gamma Distributed at 5% Significance Level							
316	Detected data appear Gamma Distributed at 5% Significance Level											
317												
318	Gamma Statistics on Detected Data Only											
319	k hat (MLE)			7.08	k star (bias corrected MLE)			3.65				
320	Theta hat (MLE)			0.003	Theta star (bias corrected MLE)			0.007				
321	nu hat (MLE)			84.94	nu star (bias corrected)			43.87				
322	MLE Mean (bias corrected)			0.024	MLE Sd (bias corrected)			0.013				
323												
324	Gamma Kaplan-Meier (KM) Statistics											
325	k hat (KM)			0.03	nu hat (KM)			3.42				
326					Adjusted Level of Significance (β)			0.04				
327	Approximate Chi Square Value (3.42, α)			0.50	Adjusted Chi Square Value (3.42, β)			0.48				
328	Approximate KM-UCL (use when n>=50)			0.01	Gamma Adjusted KM-UCL (use when n<50)			0.01				

	A	B	C	D	E	F	G	H	I	J	K	L
329	Gamma (KM) may not be used when k hat (KM) is < 0.1											
330												
331	DL/2 Statistics											
332	Mean in Original Scale					0.007	SD in Original Scale					0.008
333	95% t UCL (Assumes normality)					0.008						
334	DL/2 is not a recommended method, provided for comparisons and historical reasons											
335												
336	Nonparametric Distribution Free UCL Statistics											
337	Detected Data appear Normal Distributed at 5% Significance Level											
338												
339	Suggested UCL to Use											
340	95% KM (t) UCL					0.003	95% KM (Percentile Bootstrap) UCL					0.004
341												
342	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
343	Recommendations are based upon data size, data distribution, and skewness.											
344	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
345	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
346												
347	Anthracene											
348												
349	General Statistics											
350	Total Number of Observations					57	Number of Distinct Observations					57
351	Number of Detects					18	Number of Non-Detects					39
352	Number of Distinct Detects					18	Number of Distinct Non-Detects					39
353	Minimum Detect					0.011	Minimum Non-Detect					0.03
354	Maximum Detect					5.03	Maximum Non-Detect					1.81
355	Variance Detects					1.54	Percent Non-Detects					68.4
356	Mean Detects					0.75	SD Detects					1.24
357	Median Detects					0.24	CV Detects					1.64
358	Skewness Detects					2.71	Kurtosis Detects					8.38
359	Mean of Logged Detects					-1.62	SD of Logged Detects					1.87
360												
361	Normal GOF Test on Detects Only											
362	Shapiro Wilk Test Statistic					0.64	Shapiro Wilk GOF Test					
363	5% Shapiro Wilk Critical Value					0.89	Detected Data Not Normal at 5% Significance Level					
364	Lilliefors Test Statistic					0.27	Lilliefors GOF Test					
365	5% Lilliefors Critical Value					0.20	Detected Data Not Normal at 5% Significance Level					
366	Detected Data Not Normal at 5% Significance Level											
367												
368	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
369	Mean					0.25	Standard Error of Mean					0.10
370	SD					0.76	95% KM (BCA) UCL					0.43
371	95% KM (t) UCL					0.43	95% KM (Percentile Bootstrap) UCL					0.44
372	95% KM (z) UCL					0.42	95% KM Bootstrap t UCL					0.66
373	90% KM Chebyshev UCL					0.56	95% KM Chebyshev UCL					0.70
374	97.5% KM Chebyshev UCL					0.90	99% KM Chebyshev UCL					1.28
375												
376	Gamma GOF Tests on Detected Observations Only											
377	A-D Test Statistic					0.54	Anderson-Darling GOF Test					
378	5% A-D Critical Value					0.80	Detected data appear Gamma Distributed at 5% Significance Level					
379	K-S Test Statistic					0.16	Kolmogorov-Smirnoff GOF					
380	5% K-S Critical Value					0.21	Detected data appear Gamma Distributed at 5% Significance Level					
381	Detected data appear Gamma Distributed at 5% Significance Level											
382												
383	Gamma Statistics on Detected Data Only											
384	k hat (MLE)					0.47	k star (bias corrected MLE)					0.43
385	Theta hat (MLE)					1.58	Theta star (bias corrected MLE)					1.73
386	nu hat (MLE)					17.11	nu star (bias corrected)					15.63
387	MLE Mean (bias corrected)					0.75	MLE Sd (bias corrected)					1.14
388												
389	Gamma Kaplan-Meier (KM) Statistics											
390	k hat (KM)					0.11	nu hat (KM)					12.9
391	Approximate Chi Square Value (12.94, α)					5.85	Adjusted Chi Square Value (12.94, β)					5.72
392	Approximate KM-UCL (use when $n \geq 50$)					0.56	Gamma Adjusted KM-UCL (use when $n < 50$)					0.57
393												
394	Gamma ROS Statistics using Imputed Non-Detects											
395	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
396	GROS may not be used when kstar of detected data is small such as < 0.1											
397	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
398	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
399	Minimum					0.01	Mean					0.24
400	Maximum					5.03	Median					0.01
401	SD					0.76	CV					3.13
402	k hat (MLE)					0.30	k star (bias corrected MLE)					0.3
403	Theta hat (MLE)					0.80	Theta star (bias corrected MLE)					0.81
404	nu hat (MLE)					34.71	nu star (bias corrected)					34.2
405	MLE Mean (bias corrected)					0.24	MLE Sd (bias corrected)					0.44
406							Adjusted Level of Significance (β)					0.04
407	Approximate Chi Square Value (34.23, α)					21.84	Adjusted Chi Square Value (34.23, β)					21.5
408	Gamma Approximate UCL (use when $n \geq 50$)					0.38	Gamma Adjusted UCL (use when $n < 50$)					0.38
409												
410	Lognormal GOF Test on Detected Observations Only											
411												

	A	B	C	D	E	F	G	H	I	J	K	L	
411	Shapiro Wilk Test Statistic					0.93	Shapiro Wilk GOF Test						
412	5% Shapiro Wilk Critical Value					0.89	Detected Data appear Lognormal at 5% Significance Level						
413	Lilliefors Test Statistic					0.14	Lilliefors GOF Test						
414	5% Lilliefors Critical Value					0.20	Detected Data appear Lognormal at 5% Significance Level						
415	Detected Data appear Lognormal at 5% Significance Level												
416													
417	Lognormal ROS Statistics Using Imputed Non-Detects												
418	Mean in Original Scale					0.25	Mean in Log Scale					-3.11	
419	SD in Original Scale					0.76	SD in Log Scale					1.45	
420	95% t UCL (assumes normality of ROS data)					0.42	95% Percentile Bootstrap UCL					0.44	
421	95% BCA Bootstrap UCL					0.49	95% Bootstrap t UCL					0.62	
422	95% H-UCL (Log ROS)					0.23							
423													
424	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
425	KM Mean (logged)					-3.13	95% H-UCL (KM -Log)					0.24	
426	KM SD (logged)					1.49	95% Critical H Value (KM-Log)					3.07	
427	KM Standard Error of Mean (logged)					0.22							
428													
429	DL/2 Statistics												
430	DL/2 Normal						DL/2 Log-Transformed						
431	Mean in Original Scale					0.27	Mean in Log Scale					-2.91	
432	SD in Original Scale					0.76	SD in Log Scale					1.49	
433	95% t UCL (Assumes normality)					0.44	95% H-Stat UCL					0.30	
434	DL/2 is not a recommended method, provided for comparisons and historical reasons												
435													
436	Nonparametric Distribution Free UCL Statistics												
437	Detected Data appear Gamma Distributed at 5% Significance Level												
438													
439	Suggested UCL to Use												
440	95% KM (t) UCL					0.43	95% GROS Approximate Gamma UCL					0.38	
441	95% Approximate Gamma KM-UCL					0.56							
442													
443	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
444	Recommendations are based upon data size, data distribution, and skewness.												
445	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
446	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												
447													
448	Aroclor-1254												
449													
450	General Statistics												
451	Total Number of Observations					16	Number of Distinct Observations					16	
452	Number of Detects					13	Number of Non-Detects					3	
453	Number of Distinct Detects					13	Number of Distinct Non-Detects					3	
454	Minimum Detect					0.004	Minimum Non-Detect					0.004	
455	Maximum Detect					1.03	Maximum Non-Detect					0.005	
456	Variance Detects					0.07	Percent Non-Detects					18.7	
457	Mean Detects					0.12	SD Detects					0.27	
458	Median Detects					0.01	CV Detects					2.32	
459	Skewness Detects					3.35	Kurtosis Detects					11.6	
460	Mean of Logged Detects					-3.64	SD of Logged Detects					1.70	
461													
462	Normal GOF Test on Detects Only												
463	Shapiro Wilk Test Statistic					0.46	Shapiro Wilk GOF Test						
464	5% Shapiro Wilk Critical Value					0.86	Detected Data Not Normal at 5% Significance Level						
465	Lilliefors Test Statistic					0.34	Lilliefors GOF Test						
466	5% Lilliefors Critical Value					0.24	Detected Data Not Normal at 5% Significance Level						
467	Detected Data Not Normal at 5% Significance Level												
468													
469	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
470	Mean					0.09	Standard Error of Mean					0.06	
471	SD					0.24	95% KM (BCA) UCL					0.22	
472	95% KM (t) UCL					0.21	95% KM (Percentile Bootstrap) UCL					0.22	
473	95% KM (z) UCL					0.20	95% KM Bootstrap t UCL					0.70	
474	90% KM Chebyshev UCL					0.29	95% KM Chebyshev UCL					0.37	
475	97.5% KM Chebyshev UCL					0.49	99% KM Chebyshev UCL					0.73	
476													
477	Gamma GOF Tests on Detected Observations Only												
478	A-D Test Statistic					1.01	Anderson-Darling GOF Test						
479	5% A-D Critical Value					0.80	Detected Data Not Gamma Distributed at 5% Significance Level						
480	K-S Test Statistic					0.20	Kolmogorov-Smirnov GOF						
481	5% K-S Critical Value					0.25	Detected data appear Gamma Distributed at 5% Significance Level						
482	Detected data follow Appr. Gamma Distribution at 5% Significance Level												
483													
484	Gamma Statistics on Detected Data Only												
485	k hat (MLE)					0.42	k star (bias corrected MLE)					0.38	
486	Theta hat (MLE)					0.28	Theta star (bias corrected MLE)					0.31	
487	nu hat (MLE)					11.11	nu star (bias corrected)					9.88	
488	MLE Mean (bias corrected)					0.12	MLE Sd (bias corrected)					0.19	
489													
490	Gamma Kaplan-Meier (KM) Statistics												
491	k hat (KM)					0.16	nu hat (KM)					5.12	
492	Approximate Chi Square Value (5.12, α)					1.20	Adjusted Chi Square Value (5.12, β)					1.00	

	A	B	C	D	E	F	G	H	I	J	K	L
493	Approximate KM-UCL (use when n>=50)					0.41mma Adjusted KM-UCL (use when n<50)					0.5	
494												
495	Gamma ROS Statistics using Imputed Non-Detects											
496	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
497	GROS may not be used when kstar of detected data is small such as < 0.1											
498	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
499	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
500	Minimum				0.004		Mean				0.09	
501	Maximum				1.03		Median				0.01	
502	SD				0.25		CV				2.55	
503	k hat (MLE)				0.43		k star (bias corrected MLE)				0.39	
504	Theta hat (MLE)				0.23		Theta star (bias corrected MLE)				0.25	
505	nu hat (MLE)				13.7		nu star (bias corrected)				12.5	
506	MLE Mean (bias corrected)				0.09		MLE Sd (bias corrected)				0.15	
507							Adjusted Level of Significance (β)				0.03	
508	Approximate Chi Square Value (12.50, α)				5.56		Adjusted Chi Square Value (12.50, β)				5.04	
509	Gamma Approximate UCL (use when n>=50)				0.22		Gamma Adjusted UCL (use when n<50)				0.24	
510												
511	Lognormal GOF Test on Detected Observations Only											
512	Shapiro Wilk Test Statistic				0.91		Shapiro Wilk GOF Test					
513	5% Shapiro Wilk Critical Value				0.86		Detected Data appear Lognormal at 5% Significance Level					
514	Lilliefors Test Statistic				0.14		Lilliefors GOF Test					
515	5% Lilliefors Critical Value				0.24		Detected Data appear Lognormal at 5% Significance Level					
516	Detected Data appear Lognormal at 5% Significance Level											
517												
518	Lognormal ROS Statistics Using Imputed Non-Detects											
519	Mean in Original Scale				0.09		Mean in Log Scale				-4.05	
520	SD in Original Scale				0.25		SD in Log Scale				1.77	
521	95% t UCL (assumes normality of ROS data)				0.21		95% Percentile Bootstrap UCL				0.21	
522	95% BCA Bootstrap UCL				0.3		95% Bootstrap t UCL				0.66	
523	95% H-UCL (Log ROS)				0.53							
524												
525	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
526	KM Mean (logged)				-3.97		95% H-UCL (KM -Log)				0.35	
527	KM SD (logged)				1.63		95% Critical H Value (KM-Log)				3.78	
528	KM Standard Error of Mean (logged)				0.42							
529												
530	DL/2 Statistics											
531	DL/2 Normal					DL/2 Log-Transformed						
532	Mean in Original Scale				0.09		Mean in Log Scale				-4.08	
533	SD in Original Scale				0.25		SD in Log Scale				1.8	
534	95% t UCL (Assumes normality)				0.21		95% H-Stat UCL				0.57	
535	DL/2 is not a recommended method, provided for comparisons and historical reasons											
536												
537	Nonparametric Distribution Free UCL Statistics											
538	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
539												
540	Suggested UCL to Use											
541	95% KM (Chebyshev) UCL				0.37		95% GROS Adjusted Gamma UCL				0.24	
542	95% Adjusted Gamma KM-UCL				0.5							
543												
544	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
545	Recommendations are based upon data size, data distribution, and skewness.											
546	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
547	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
548												
549	Aroclor-1260											
550												
551	General Statistics											
552	Total Number of Observations				16		Number of Distinct Observations				16	
553	Number of Detects				9		Number of Non-Detects				7	
554	Number of Distinct Detects				9		Number of Distinct Non-Detects				7	
555	Minimum Detect				0.005		Minimum Non-Detect				0.004	
556	Maximum Detect				0.61		Maximum Non-Detect				0.005	
557	Variance Detects				0.03		Percent Non-Detects				43.7	
558	Mean Detects				0.10		SD Detects				0.19	
559	Median Detects				0.03		CV Detects				1.82	
560	Skewness Detects				2.77		Kurtosis Detects				7.93	
561	Mean of Logged Detects				-3.27		SD of Logged Detects				1.46	
562												
563	Normal GOF Test on Detects Only											
564	Shapiro Wilk Test Statistic				0.56		Shapiro Wilk GOF Test					
565	5% Shapiro Wilk Critical Value				0.82		Detected Data Not Normal at 5% Significance Level					
566	Lilliefors Test Statistic				0.37		Lilliefors GOF Test					
567	5% Lilliefors Critical Value				0.29		Detected Data Not Normal at 5% Significance Level					
568	Detected Data Not Normal at 5% Significance Level											
569												
570	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
571	Mean				0.06		Standard Error of Mean				0.03	
572	SD				0.14		95% KM (BCA) UCL				0.13	
573	95% KM (t) UCL				0.13		95% KM (Percentile Bootstrap) UCL				0.13	
574	95% KM (z) UCL				0.12		95% KM Bootstrap t UCL				0.33	

	A	B	C	D	E	F	G	H	I	J	K	L
575			90% KM Chebyshev UCL		0.17		95% KM Chebyshev UCL		0.23			
576			97.5% KM Chebyshev UCL		0.30		99% KM Chebyshev UCL		0.45			
577												
578			Gamma GOF Tests on Detected Observations Only									
579			A-D Test Statistic		0.60		Anderson-Darling GOF Test					
580			5% A-D Critical Value		0.76		data appear Gamma Distributed at 5% Significance Level					
581			K-S Test Statistic		0.20		Kolmogrov-Smirnoff GOF					
582			5% K-S Critical Value		0.29		data appear Gamma Distributed at 5% Significance Level					
583			Detected data appear Gamma Distributed at 5% Significance Level									
584												
585			Gamma Statistics on Detected Data Only									
586			k hat (MLE)		0.59		k star (bias corrected MLE)		0.47			
587			Theta hat (MLE)		0.18		Theta star (bias corrected MLE)		0.22			
588			nu hat (MLE)		10.7		nu star (bias corrected)		8.47			
589			MLE Mean (bias corrected)		0.10		MLE Sd (bias corrected)		0.15			
590												
591			Gamma Kaplan-Meier (KM) Statistics									
592			k hat (KM)		0.17		nu hat (KM)		5.64			
593			Approximate Chi Square Value (5.65, α)		1.46		Adjusted Chi Square Value (5.65, β)		1.23			
594			Approximate KM-UCL (use when n>=50)		0.23		Gamma Adjusted KM-UCL (use when n<50)		0.28			
595												
596			Gamma ROS Statistics using Imputed Non-Detects									
597			GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs									
598			GROS may not be used when kstar of detected data is small such as < 0.1									
599			For such situations, GROS method tends to yield inflated values of UCLs and BTVs									
600			Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates									
601			Minimum		0.005		Mean		0.06			
602			Maximum		0.61		Median		0.01			
603			SD		0.15		CV		2.34			
604			k hat (MLE)		0.55		k star (bias corrected MLE)		0.49			
605			Theta hat (MLE)		0.11		Theta star (bias corrected MLE)		0.13			
606			nu hat (MLE)		17.8		nu star (bias corrected)		15.8			
607			MLE Mean (bias corrected)		0.06		MLE Sd (bias corrected)		0.09			
608							Adjusted Level of Significance (β)		0.03			
609			Approximate Chi Square Value (15.87, α)		7.87		Adjusted Chi Square Value (15.87, β)		7.23			
610			Gamma Approximate UCL (use when n>=50)		0.13		Gamma Adjusted UCL (use when n<50)		0.14			
611												
612			Lognormal GOF Test on Detected Observations Only									
613			Shapiro Wilk Test Statistic		0.95		Shapiro Wilk GOF Test					
614			5% Shapiro Wilk Critical Value		0.82		Detected Data appear Lognormal at 5% Significance Level					
615			Lilliefors Test Statistic		0.14		Lilliefors GOF Test					
616			5% Lilliefors Critical Value		0.29		Detected Data appear Lognormal at 5% Significance Level					
617			Detected Data appear Lognormal at 5% Significance Level									
618												
619			Lognormal ROS Statistics Using Imputed Non-Detects									
620			Mean in Original Scale		0.06		Mean in Log Scale		-4.95			
621			SD in Original Scale		0.15		SD in Log Scale		2.24			
622			95% t UCL (assumes normality of ROS data)		0.12		95% Percentile Bootstrap UCL		0.13			
623			95% BCA Bootstrap UCL		0.17		95% Bootstrap t UCL		0.35			
624			95% H-UCL (Log ROS)		1.49							
625												
626			UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed									
627			KM Mean (logged)		-4.25		95% H-UCL (KM -Log)		0.18			
628			KM SD (logged)		1.51		95% Critical H Value (KM-Log)		3.57			
629			KM Standard Error of Mean (logged)		0.40							
630												
631			DL/2 Statistics									
632			DL/2 Normal				DL/2 Log-Transformed					
633			Mean in Original Scale		0.06		Mean in Log Scale		-4.48			
634			SD in Original Scale		0.15		SD in Log Scale		1.77			
635			95% t UCL (Assumes normality)		0.12		95% H-Stat UCL		0.34			
636			DL/2 is not a recommended method, provided for comparisons and historical reasons									
637												
638			Nonparametric Distribution Free UCL Statistics									
639			Detected Data appear Gamma Distributed at 5% Significance Level									
640												
641			Suggested UCL to Use									
642			95% KM (BCA) UCL		0.13		95% GROS Adjusted Gamma UCL		0.14			
643			95% Adjusted Gamma KM-UCL		0.28							
644												
645			Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate									
646			Recommendations are based upon data size, data distribution, and skewness.									
647			Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and									
648			Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult									
649												
650			Arsenic									
651												
652			General Statistics									
653			Total Number of Observations		57		Number of Distinct Observations		46			
654			Number of Detects		56		Number of Non-Detects		1			
655			Number of Distinct Detects		45		Number of Distinct Non-Detects		1			
656			Minimum Detect		0.51		Minimum Non-Detect		1.08			

	A	B	C	D	E	F	G	H	I	J	K	L
657					Maximum Detect	5.81				Maximum Non-Detect		1.08
658					Variance Detects	0.56				Percent Non-Detects		1.75
659					Mean Detects	1.77				SD Detects		0.75
660					Median Detects	1.69				CV Detects		0.42
661					Skewness Detects	3.07				Kurtosis Detects		14.6
662					Mean of Logged Detects	0.50				SD of Logged Detects		0.35
663												
664					Normal GOF Test on Detects Only							
665					Shapiro Wilk Test Statistic	0.75				Normal GOF Test on Detected Observations Only		
666					5% Shapiro Wilk P Value	6.683E-05				Detected Data Not Normal at 5% Significance Level		
667					Lilliefors Test Statistic	0.22				Lilliefors GOF Test		
668					5% Lilliefors Critical Value	0.11				Detected Data Not Normal at 5% Significance Level		
669					Detected Data Not Normal at 5% Significance Level							
670												
671					Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs							
672					Mean	1.75				Standard Error of Mean		0.10
673					SD	0.75				95% KM (BCA) UCL		1.93
674					95% KM (t) UCL	1.92				95% KM (Percentile Bootstrap) UCL		1.92
675					95% KM (z) UCL	1.92				95% KM Bootstrap t UCL		2.00
676					90% KM Chebyshev UCL	2.05				95% KM Chebyshev UCL		2.19
677					97.5% KM Chebyshev UCL	2.38				99% KM Chebyshev UCL		2.75
678												
679					Gamma GOF Tests on Detected Observations Only							
680					A-D Test Statistic	1.59				Anderson-Darling GOF Test		
681					5% A-D Critical Value	0.75				Detected Data Not Gamma Distributed at 5% Significance Level		
682					K-S Test Statistic	0.17				Kolmogrov-Smirnoff GOF		
683					5% K-S Critical Value	0.11				Detected Data Not Gamma Distributed at 5% Significance Level		
684					Detected Data Not Gamma Distributed at 5% Significance Level							
685												
686					Gamma Statistics on Detected Data Only							
687					k hat (MLE)	7.75				k star (bias corrected MLE)		7.35
688					Theta hat (MLE)	0.22				Theta star (bias corrected MLE)		0.24
689					nu hat (MLE)	868.3				nu star (bias corrected)		823.2
690					MLE Mean (bias corrected)	1.77				MLE Sd (bias corrected)		0.65
691												
692					Gamma Kaplan-Meier (KM) Statistics							
693					k hat (KM)	5.46				nu hat (KM)		622.9
694					Approximate Chi Square Value (622.91, α)	566				Adjusted Chi Square Value (622.91, β)		564.6
695					Approximate KM-UCL (use when $n \geq 50$)	1.93				Gamma Adjusted KM-UCL (use when $n < 50$)		1.93
696												
697					Gamma ROS Statistics using Imputed Non-Detects							
698					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
699					GROS may not be used when kstar of detected data is small such as < 0.1							
700					For such situations, GROS method tends to yield inflated values of UCLs and BTVs							
701					Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate							
702					Minimum	0.51				Mean		1.75
703					Maximum	5.81				Median		1.69
704					SD	0.76				CV		0.43
705					k hat (MLE)	7.31				k star (bias corrected MLE)		6.94
706					Theta hat (MLE)	0.24				Theta star (bias corrected MLE)		0.25
707					nu hat (MLE)	834.2				nu star (bias corrected)		791.7
708					MLE Mean (bias corrected)	1.75				MLE Sd (bias corrected)		0.66
709										Adjusted Level of Significance (β)		0.04
710					Approximate Chi Square Value (791.66, α)	727.4				Adjusted Chi Square Value (791.66, β)		725.8
711					Gamma Approximate UCL (use when $n \geq 50$)	1.91				Gamma Adjusted UCL (use when $n < 50$)		1.91
712												
713					Lognormal GOF Test on Detected Observations Only							
714					Lilliefors Test Statistic	0.14				Lilliefors GOF Test		
715					5% Lilliefors Critical Value	0.11				Detected Data Not Lognormal at 5% Significance Level		
716					Detected Data Not Lognormal at 5% Significance Level							
717												
718					Lognormal ROS Statistics Using Imputed Non-Detects							
719					Mean in Original Scale	1.75				Mean in Log Scale		0.49
720					SD in Original Scale	0.75				SD in Log Scale		0.36
721					95% t UCL (assumes normality of ROS data)	1.92				95% Percentile Bootstrap UCL		1.92
722					95% BCA Bootstrap UCL	1.96				95% Bootstrap t UCL		1.99
723					95% H-UCL (Log ROS)	1.91						
724												
725					DL/2 Statistics							
726					DL/2 Normal			DL/2 Log-Transformed				
727					Mean in Original Scale	1.75				Mean in Log Scale		0.48
728					SD in Original Scale	0.76				SD in Log Scale		0.38
729					95% t UCL (Assumes normality)	1.92				95% H-Stat UCL		1.92
730					DL/2 is not a recommended method, provided for comparisons and historical reasons							
731												
732					Nonparametric Distribution Free UCL Statistics							
733					Data do not follow a Discernible Distribution at 5% Significance Level							
734												
735					Suggested UCL to Use							
736					95% KM (Chebyshev) UCL	2.19						
737												
738					Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate							

	A	B	C	D	E	F	G	H	I	J	K	L	
739	Recommendations are based upon data size, data distribution, and skewness.												
740	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Singh (2003). However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
741													
742													
743													
744	Barium												
745													
746	General Statistics												
747	Total Number of Observations					57	Number of Distinct Observations					56	
748							Number of Missing Observations					0	
749	Minimum					19.6	Mean					79.4	
750	Maximum					184	Median					75.4	
751	SD					31.4	Std. Error of Mean					4.16	
752	Coefficient of Variation					0.39	Skewness					1.06	
753													
754	Normal GOF Test												
755	Shapiro Wilk Test Statistic					0.94	Shapiro Wilk GOF Test						
756	5% Shapiro Wilk P Value					0.01	Data Not Normal at 5% Significance Level						
757	Lilliefors Test Statistic					0.13	Lilliefors GOF Test						
758	5% Lilliefors Critical Value					0.11	Data Not Normal at 5% Significance Level						
759	Data Not Normal at 5% Significance Level												
760													
761	Assuming Normal Distribution												
762	95% Normal UCL						95% UCLs (Adjusted for Skewness)						
763	95% Student's-t UCL					86.4	95% Adjusted-CLT UCL (Chen-1995)					86.9	
764							95% Modified-t UCL (Johnson-1978)					86.5	
765													
766	Gamma GOF Test												
767	A-D Test Statistic					0.23	Anderson-Darling Gamma GOF Test						
768	5% A-D Critical Value					0.75	Data appear Gamma Distributed at 5% Significance Level						
769	K-S Test Statistic					0.07	Kolmogrov-Smirnov Gamma GOF Test						
770	5% K-S Critical Value					0.11	Data appear Gamma Distributed at 5% Significance Level						
771	Detected data appear Gamma Distributed at 5% Significance Level												
772													
773	Gamma Statistics												
774	k hat (MLE)					6.80	k star (bias corrected MLE)					6.46	
775	Theta hat (MLE)					11.6	Theta star (bias corrected MLE)					12.3	
776	nu hat (MLE)					776.3	nu star (bias corrected)					736.7	
777	MLE Mean (bias corrected)					79.4	MLE Sd (bias corrected)					31.2	
778							Approximate Chi Square Value (0.05)					674.8	
779	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					673.2	
780													
781	Assuming Gamma Distribution												
782	Approximate Gamma UCL (use when n>=50)					86.7	Adjusted Gamma UCL (use when n<50)					86.9	
783													
784	Lognormal GOF Test												
785	Shapiro Wilk Test Statistic					0.98	Shapiro Wilk Lognormal GOF Test						
786	5% Shapiro Wilk P Value					0.88	Data appear Lognormal at 5% Significance Level						
787	Lilliefors Test Statistic					0.06	Lilliefors Lognormal GOF Test						
788	5% Lilliefors Critical Value					0.11	Data appear Lognormal at 5% Significance Level						
789	Data appear Lognormal at 5% Significance Level												
790													
791	Lognormal Statistics												
792	Minimum of Logged Data					2.97	Mean of logged Data					4.3	
793	Maximum of Logged Data					5.21	SD of logged Data					0.39	
794													
795	Assuming Lognormal Distribution												
796	95% H-UCL					87.9	90% Chebyshev (MVUE) UCL					92.7	
797	95% Chebyshev (MVUE) UCL					98.7	97.5% Chebyshev (MVUE) UCL					106.9	
798	99% Chebyshev (MVUE) UCL					123.1							
799													
800	Nonparametric Distribution Free UCL Statistics												
801	Data appear to follow a Discernible Distribution at 5% Significance Level												
802													
803	Nonparametric Distribution Free UCLs												
804	95% CLT UCL					86.3	95% Jackknife UCL					86.4	
805	95% Standard Bootstrap UCL					86.3	95% Bootstrap-t UCL					87.2	
806	95% Hall's Bootstrap UCL					87.0	95% Percentile Bootstrap UCL					86.1	
807	95% BCA Bootstrap UCL					86.2							
808	90% Chebyshev(Mean, Sd) UCL					91.9	95% Chebyshev(Mean, Sd) UCL					97.6	
809	97.5% Chebyshev(Mean, Sd) UCL					105.5	99% Chebyshev(Mean, Sd) UCL					120.9	
810													
811	Suggested UCL to Use												
812	95% Approximate Gamma UCL					86.7							
813													
814	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL. Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh (2003). However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												
815													
816													
817													
818													
819	Benzo(a)anthracene												
820													

	A	B	C	D	E	F	G	H	I	J	K	L
821	General Statistics											
822	Total Number of Observations					57	Number of Distinct Observations					56
823	Number of Detects					30	Number of Non-Detects					27
824	Number of Distinct Detects					29	Number of Distinct Non-Detects					27
825	Minimum Detect					0.011	Minimum Non-Detect					0.03
826	Maximum Detect					11.4	Maximum Non-Detect					1.81
827	Variance Detects					6.64	Percent Non-Detects					47.3
828	Mean Detects					1.36	SD Detects					2.57
829	Median Detects					0.076	CV Detects					1.88
830	Skewness Detects					2.57	Kurtosis Detects					7.35
831	Mean of Logged Detects					-1.68	SD of Logged Detects					2.16
832												
833	Normal GOF Test on Detects Only											
834	Shapiro Wilk Test Statistic					0.60	Shapiro Wilk GOF Test					
835	5% Shapiro Wilk Critical Value					0.92	Detected Data Not Normal at 5% Significance Level					
836	Lilliefors Test Statistic					0.35	Lilliefors GOF Test					
837	5% Lilliefors Critical Value					0.16	Detected Data Not Normal at 5% Significance Level					
838	Detected Data Not Normal at 5% Significance Level											
839												
840	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
841	Mean					0.73	Standard Error of Mean					0.26
842	SD					1.95	95% KM (BCA) UCL					1.24
843	95% KM (t) UCL					1.17	95% KM (Percentile Bootstrap) UCL					1.18
844	95% KM (z) UCL					1.16	95% KM Bootstrap t UCL					1.49
845	90% KM Chebyshev UCL					1.52	95% KM Chebyshev UCL					1.88
846	97.5% KM Chebyshev UCL					2.38	99% KM Chebyshev UCL					3.35
847												
848	Gamma GOF Tests on Detected Observations Only											
849	A-D Test Statistic					2.19	Anderson-Darling GOF Test					
850	5% A-D Critical Value					0.84	Detected Data Not Gamma Distributed at 5% Significance Level					
851	K-S Test Statistic					0.24	Kolmogorov-Smirnoff GOF					
852	5% K-S Critical Value					0.17	Detected Data Not Gamma Distributed at 5% Significance Level					
853	Detected Data Not Gamma Distributed at 5% Significance Level											
854												
855	Gamma Statistics on Detected Data Only											
856	k hat (MLE)					0.33	k star (bias corrected MLE)					0.32
857	Theta hat (MLE)					4.03	Theta star (bias corrected MLE)					4.18
858	nu hat (MLE)					20.3	nu star (bias corrected)					19.6
859	MLE Mean (bias corrected)					1.36	MLE Sd (bias corrected)					2.39
860												
861	Gamma Kaplan-Meier (KM) Statistics											
862	k hat (KM)					0.14	nu hat (KM)					16
863	Approximate Chi Square Value (16.00, α)					7.96	Adjusted Chi Square Value (16.00, β)					7.81
864	Approximate KM-UCL (use when n>=50)					1.47	Gamma Adjusted KM-UCL (use when n<50)					1.50
865												
866	Gamma ROS Statistics using Imputed Non-Detects											
867	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
868	GROS may not be used when kstar of detected data is small such as < 0.1											
869	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
870	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
871	Minimum					0.01	Mean					0.72
872	Maximum					11.4	Median					0.015
873	SD					1.97	CV					2.73
874	k hat (MLE)					0.25	k star (bias corrected MLE)					0.25
875	Theta hat (MLE)					2.81	Theta star (bias corrected MLE)					2.83
876	nu hat (MLE)					29.3	nu star (bias corrected)					29.1
877	MLE Mean (bias corrected)					0.72	MLE Sd (bias corrected)					1.43
878							Adjusted Level of Significance (β)					0.04
879	Approximate Chi Square Value (29.14, α)					17.8	Adjusted Chi Square Value (29.14, β)					17.5
880	Gamma Approximate UCL (use when n>=50)					1.18	Gamma Adjusted UCL (use when n<50)					1.19
881												
882	Lognormal GOF Test on Detected Observations Only											
883	Shapiro Wilk Test Statistic					0.87	Shapiro Wilk GOF Test					
884	5% Shapiro Wilk Critical Value					0.92	Detected Data Not Lognormal at 5% Significance Level					
885	Lilliefors Test Statistic					0.18	Lilliefors GOF Test					
886	5% Lilliefors Critical Value					0.16	Detected Data Not Lognormal at 5% Significance Level					
887	Detected Data Not Lognormal at 5% Significance Level											
888												
889	Lognormal ROS Statistics Using Imputed Non-Detects											
890	Mean in Original Scale					0.73	Mean in Log Scale					-2.60
891	SD in Original Scale					1.97	SD in Log Scale					1.84
892	95% t UCL (assumes normality of ROS data)					1.16	95% Percentile Bootstrap UCL					1.19
893	95% BCA Bootstrap UCL					1.33	95% Bootstrap t UCL					1.51
894	95% H-UCL (Log ROS)					0.97						
895												
896	DL/2 Statistics											
897	DL/2 Normal						DL/2 Log-Transformed					
898	Mean in Original Scale					0.75	Mean in Log Scale					-2.51
899	SD in Original Scale					1.97	SD in Log Scale					1.88
900	95% t UCL (Assumes normality)					1.18	95% H-Stat UCL					1.18
901	DL/2 is not a recommended method, provided for comparisons and historical reasons											
902												

	A	B	C	D	E	F	G	H	I	J	K	L
903	Nonparametric Distribution Free UCL Statistics											
904	Data do not follow a Discernible Distribution at 5% Significance Level											
905												
906	Suggested UCL to Use											
907	99% KM (Chebyshev) UCL				3.35							
908												
909	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
910	Recommendations are based upon data size, data distribution, and skewness.											
911	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
912	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
913												
914	Benzo(a)pyrene											
915												
916	General Statistics											
917	Total Number of Observations				57		Number of Distinct Observations				57	
918	Number of Detects				29		Number of Non-Detects				28	
919	Number of Distinct Detects				29		Number of Distinct Non-Detects				28	
920	Minimum Detect				0.01		Minimum Non-Detect				0.03	
921	Maximum Detect				10.1		Maximum Non-Detect				0.40	
922	Variance Detects				6.21		Percent Non-Detects				49.17	
923	Mean Detects				1.41		SD Detects				2.49	
924	Median Detects				0.11		CV Detects				1.76	
925	Skewness Detects				2.20		Kurtosis Detects				4.71	
926	Mean of Logged Detects				-1.52		SD of Logged Detects				2.14	
927												
928	Normal GOF Test on Detects Only											
929	Shapiro Wilk Test Statistic				0.63		Shapiro Wilk GOF Test					
930	5% Shapiro Wilk Critical Value				0.92		Detected Data Not Normal at 5% Significance Level					
931	Lilliefors Test Statistic				0.32		Lilliefors GOF Test					
932	5% Lilliefors Critical Value				0.16		Detected Data Not Normal at 5% Significance Level					
933	Detected Data Not Normal at 5% Significance Level											
934												
935	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
936	Mean				0.73		Standard Error of Mean				0.25	
937	SD				1.87		95% KM (BCA) UCL				1.19	
938	95% KM (t) UCL				1.15		95% KM (Percentile Bootstrap) UCL				1.17	
939	95% KM (z) UCL				1.14		95% KM Bootstrap t UCL				1.37	
940	90% KM Chebyshev UCL				1.49		95% KM Chebyshev UCL				1.83	
941	97.5% KM Chebyshev UCL				2.31		99% KM Chebyshev UCL				3.25	
942												
943	Gamma GOF Tests on Detected Observations Only											
944	A-D Test Statistic				1.66		Anderson-Darling GOF Test					
945	5% A-D Critical Value				0.84		Detected Data Not Gamma Distributed at 5% Significance Level					
946	K-S Test Statistic				0.20		Kolmogorov-Smirnov GOF					
947	5% K-S Critical Value				0.17		Detected Data Not Gamma Distributed at 5% Significance Level					
948	Detected Data Not Gamma Distributed at 5% Significance Level											
949												
950	Gamma Statistics on Detected Data Only											
951	k hat (MLE)				0.35		k star (bias corrected MLE)				0.34	
952	Theta hat (MLE)				3.94		Theta star (bias corrected MLE)				4.10	
953	nu hat (MLE)				20.74		nu star (bias corrected)				19.90	
954	MLE Mean (bias corrected)				1.41		MLE Sd (bias corrected)				2.40	
955												
956	Gamma Kaplan-Meier (KM) Statistics											
957	k hat (KM)				0.15		nu hat (KM)				17.23	
958	Approximate Chi Square Value (17.28, α)				8.87		Adjusted Chi Square Value (17.28, β)				8.71	
959	Approximate KM-UCL (use when n>=50)				1.42		Gamma Adjusted KM-UCL (use when n<50)				1.45	
960												
961	Gamma ROS Statistics using Imputed Non-Detects											
962	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
963	GROS may not be used when kstar of detected data is small such as < 0.1											
964	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
965	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
966	Minimum				0.01		Mean				0.72	
967	Maximum				10.1		Median				0.01	
968	SD				1.89		CV				2.62	
969	k hat (MLE)				0.26		k star (bias corrected MLE)				0.25	
970	Theta hat (MLE)				2.78		Theta star (bias corrected MLE)				2.80	
971	nu hat (MLE)				29.64		nu star (bias corrected)				29.43	
972	MLE Mean (bias corrected)				0.72		MLE Sd (bias corrected)				1.42	
973							Adjusted Level of Significance (β)				0.04	
974	Approximate Chi Square Value (29.42, α)				18.04		Adjusted Chi Square Value (29.42, β)				17.8	
975	Gamma Approximate UCL (use when n>=50)				1.18		Gamma Adjusted UCL (use when n<50)				1.19	
976												
977	Lognormal GOF Test on Detected Observations Only											
978	Shapiro Wilk Test Statistic				0.90		Shapiro Wilk GOF Test					
979	5% Shapiro Wilk Critical Value				0.92		Detected Data Not Lognormal at 5% Significance Level					
980	Lilliefors Test Statistic				0.15		Lilliefors GOF Test					
981	5% Lilliefors Critical Value				0.16		Detected Data appear Lognormal at 5% Significance Level					
982	Detected Data appear Approximate Lognormal at 5% Significance Level											
983												
984	Lognormal ROS Statistics Using Imputed Non-Detects											

	A	B	C	D	E	F	G	H	I	J	K	L
985	Mean in Original Scale					0.73	Mean in Log Scale					-2.54
986	SD in Original Scale					1.89	SD in Log Scale					1.85
987	95% t UCL (assumes normality of ROS data)					1.15	95% Percentile Bootstrap UCL					1.16
988	95% BCA Bootstrap UCL					1.28	95% Bootstrap t UCL					1.45
989	95% H-UCL (Log ROS)					1.04						
990												
991	PLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
992	KM Mean (logged)					-2.59	95% H-UCL (KM -Log)					1.08
993	KM SD (logged)					1.88	95% Critical H Value (KM-Log)					3.60
994	KM Standard Error of Mean (logged)					0.26						
995												
996	DL/2 Statistics											
997	DL/2 Normal						DL/2 Log-Transformed					
998	Mean in Original Scale					0.73	Mean in Log Scale					-2.53
999	SD in Original Scale					1.89	SD in Log Scale					1.88
1000	95% t UCL (Assumes normality)					1.15	95% H-Stat UCL					1.14
1001	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1002												
1003	Nonparametric Distribution Free UCL Statistics											
1004	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1005												
1006	Suggested UCL to Use											
1007	99% KM (Chebyshev) UCL					3.25						
1008												
1009	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1010	Recommendations are based upon data size, data distribution, and skewness.											
1011	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1012	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
1013												
1014	Benzo(b)fluoranthene											
1015												
1016	General Statistics											
1017	Total Number of Observations					57	Number of Distinct Observations					56
1018	Number of Detects					31	Number of Non-Detects					26
1019	Number of Distinct Detects					31	Number of Distinct Non-Detects					26
1020	Minimum Detect					0.014	Minimum Non-Detect					0.03
1021	Maximum Detect					19.6	Maximum Non-Detect					0.40
1022	Variance Detects					26.8	Percent Non-Detects					45.6
1023	Mean Detects					2.68	SD Detects					5.17
1024	Median Detects					0.14	CV Detects					1.92
1025	Skewness Detects					2.37	Kurtosis Detects					5.02
1026	Mean of Logged Detects					-1.13	SD of Logged Detects					2.3
1027												
1028	Normal GOF Test on Detects Only											
1029	Shapiro Wilk Test Statistic					0.58	Shapiro Wilk GOF Test					
1030	5% Shapiro Wilk Critical Value					0.92	Detected Data Not Normal at 5% Significance Level					
1031	Lilliefors Test Statistic					0.32	Lilliefors GOF Test					
1032	5% Lilliefors Critical Value					0.15	Detected Data Not Normal at 5% Significance Level					
1033	Detected Data Not Normal at 5% Significance Level											
1034												
1035	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1036	Mean					1.47	Standard Error of Mean					0.53
1037	SD					3.98	95% KM (BCA) UCL					2.40
1038	95% KM (t) UCL					2.37	95% KM (Percentile Bootstrap) UCL					2.42
1039	95% KM (z) UCL					2.35	95% KM Bootstrap t UCL					2.90
1040	90% KM Chebyshev UCL					3.08	95% KM Chebyshev UCL					3.81
1041	97.5% KM Chebyshev UCL					4.82	99% KM Chebyshev UCL					6.81
1042												
1043	Gamma GOF Tests on Detected Observations Only											
1044	A-D Test Statistic					1.76	Anderson-Darling GOF Test					
1045	5% A-D Critical Value					0.85	Detected Data Not Gamma Distributed at 5% Significance Level					
1046	K-S Test Statistic					0.21	Kolmogorov-Smirnov GOF					
1047	5% K-S Critical Value					0.17	Detected Data Not Gamma Distributed at 5% Significance Level					
1048	Detected Data Not Gamma Distributed at 5% Significance Level											
1049												
1050	Gamma Statistics on Detected Data Only											
1051	k hat (MLE)					0.32	k star (bias corrected MLE)					0.31
1052	Theta hat (MLE)					8.36	Theta star (bias corrected MLE)					8.62
1053	nu hat (MLE)					19.9	nu star (bias corrected)					19.3
1054	MLE Mean (bias corrected)					2.68	MLE Sd (bias corrected)					4.81
1055												
1056	Gamma Kaplan-Meier (KM) Statistics											
1057	k hat (KM)					0.13	nu hat (KM)					15.6
1058	Approximate Chi Square Value (15.61, α)					7.69	Adjusted Chi Square Value (15.61, β)					7.54
1059	Approximate KM-UCL (use when n>=50)					2.99	Gamma Adjusted KM-UCL (use when n<50)					3.05
1060												
1061	Gamma ROS Statistics using Imputed Non-Detects											
1062	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1063	GROS may not be used when kstar of detected data is small such as < 0.1											
1064	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1065	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1066	Minimum					0.01	Mean					1.46

	A	B	C	D	E	F	G	H	I	J	K	L
1067	Maximum					19.6	Median					0.02
1068	SD					4.02	CV					2.74
1069	k hat (MLE)					0.23	k star (bias corrected MLE)					0.23
1070	Theta hat (MLE)					6.32	Theta star (bias corrected MLE)					6.33
1071	nu hat (MLE)					26.4	nu star (bias corrected)					26.3
1072	MLE Mean (bias corrected)					1.46	MLE Sd (bias corrected)					3.04
1073							Adjusted Level of Significance (β)					0.04
1074	Approximate Chi Square Value (26.38, α)					15.6	Adjusted Chi Square Value (26.38, β)					15.4
1075	Gamma Approximate UCL (use when $n \geq 50$)					2.46	Gamma Adjusted UCL (use when $n < 50$)					2.50
1076												
1077	Lognormal GOF Test on Detected Observations Only											
1078	Shapiro Wilk Test Statistic					0.91	Shapiro Wilk GOF Test					
1079	5% Shapiro Wilk Critical Value					0.92	Detected Data Not Lognormal at 5% Significance Level					
1080	Lilliefors Test Statistic					0.15	Lilliefors GOF Test					
1081	5% Lilliefors Critical Value					0.15	Detected Data appear Lognormal at 5% Significance Level					
1082	Detected Data appear Approximate Lognormal at 5% Significance Level											
1083												
1084	Lognormal ROS Statistics Using Imputed Non-Detects											
1085	Mean in Original Scale					1.47	Mean in Log Scale					-2.38
1086	SD in Original Scale					4.01	SD in Log Scale					2.17
1087	95% t UCL (assumes normality of ROS data)					2.36	95% Percentile Bootstrap UCL					2.32
1088	95% BCA Bootstrap UCL					2.64	95% Bootstrap t UCL					2.84
1089	95% H-UCL (Log ROS)					3.21						
1090												
1091	Results using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1092	KM Mean (logged)					-2.30	95% H-UCL (KM -Log)					2.86
1093	KM SD (logged)					2.11	95% Critical H Value (KM-Log)					3.95
1094	KM Standard Error of Mean (logged)					0.29						
1095												
1096	DL/2 Statistics											
1097	DL/2 Normal						DL/2 Log-Transformed					
1098	Mean in Original Scale					1.47	Mean in Log Scale					-2.24
1099	SD in Original Scale					4.01	SD in Log Scale					2.11
1100	95% t UCL (Assumes normality)					2.36	95% H-Stat UCL					3.04
1101	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1102												
1103	Nonparametric Distribution Free UCL Statistics											
1104	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1105												
1106	Suggested UCL to Use											
1107	99% KM (Chebyshev) UCL					6.81						
1108												
1109	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1110	Recommendations are based upon data size, data distribution, and skewness.											
1111	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1112	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
1113												
1114	Benzo(g,h,i)perylene											
1115												
1116	General Statistics											
1117	Total Number of Observations					57	Number of Distinct Observations					56
1118	Number of Detects					19	Number of Non-Detects					38
1119	Number of Distinct Detects					19	Number of Distinct Non-Detects					38
1120	Minimum Detect					0.02	Minimum Non-Detect					0.03
1121	Maximum Detect					4.88	Maximum Non-Detect					1.81
1122	Variance Detects					1.91	Percent Non-Detects					66.6
1123	Mean Detects					1.07	SD Detects					1.38
1124	Median Detects					0.17	CV Detects					1.28
1125	Skewness Detects					1.48	Kurtosis Detects					1.76
1126	Mean of Logged Detects					-1.08	SD of Logged Detects					1.77
1127												
1128	Normal GOF Test on Detects Only											
1129	Shapiro Wilk Test Statistic					0.77	Shapiro Wilk GOF Test					
1130	5% Shapiro Wilk Critical Value					0.90	Detected Data Not Normal at 5% Significance Level					
1131	Lilliefors Test Statistic					0.26	Lilliefors GOF Test					
1132	5% Lilliefors Critical Value					0.20	Detected Data Not Normal at 5% Significance Level					
1133	Detected Data Not Normal at 5% Significance Level											
1134												
1135	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1136	Mean					0.38	Standard Error of Mean					0.12
1137	SD					0.92	95% KM (BCA) UCL					0.62
1138	95% KM (t) UCL					0.59	95% KM (Percentile Bootstrap) UCL					0.60
1139	95% KM (z) UCL					0.58	95% KM Bootstrap t UCL					0.69
1140	90% KM Chebyshev UCL					0.75	95% KM Chebyshev UCL					0.92
1141	97.5% KM Chebyshev UCL					1.16	99% KM Chebyshev UCL					1.63
1142												
1143	Gamma GOF Tests on Detected Observations Only											
1144	A-D Test Statistic					0.78	Anderson-Darling GOF Test					
1145	5% A-D Critical Value					0.79	Detected Data appear Gamma Distributed at 5% Significance Level					
1146	K-S Test Statistic					0.23	Kolmogorov-Smirnov GOF					
1147	5% K-S Critical Value					0.20	Detected Data Not Gamma Distributed at 5% Significance Level					
1148	Detected data follow Appr. Gamma Distribution at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
1149												
1150	Gamma Statistics on Detected Data Only											
1151	k hat (MLE)				0.54		k star (bias corrected MLE)				0.49	
1152	Theta hat (MLE)				1.98		Theta star (bias corrected MLE)				2.18	
1153	nu hat (MLE)				20.54		nu star (bias corrected)				18.61	
1154	MLE Mean (bias corrected)				1.07		MLE Sd (bias corrected)				1.53	
1155												
1156	Gamma Kaplan-Meier (KM) Statistics											
1157	k hat (KM)				0.17		nu hat (KM)				19.70	
1158	Approximate Chi Square Value (19.70, α)				10.61		Adjusted Chi Square Value (19.70, β)				10.44	
1159	Approximate KM-UCL (use when n>=50)				0.70		Gamma Adjusted KM-UCL (use when n<50)				0.72	
1160												
1161	Gamma ROS Statistics using Imputed Non-Detects											
1162	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1163	GROS may not be used when kstar of detected data is small such as < 0.1											
1164	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1165	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1166	Minimum				0.01		Mean				0.36	
1167	Maximum				4.88		Median				0.01	
1168	SD				0.93		CV				2.55	
1169	k hat (MLE)				0.28		k star (bias corrected MLE)				0.28	
1170	Theta hat (MLE)				1.27		Theta star (bias corrected MLE)				1.28	
1171	nu hat (MLE)				32.61		nu star (bias corrected)				32.25	
1172	MLE Mean (bias corrected)				0.36		MLE Sd (bias corrected)				0.68	
1173							Adjusted Level of Significance (β)				0.04	
1174	Approximate Chi Square Value (32.29, α)				20.3		Adjusted Chi Square Value (32.29, β)				20.0	
1175	Gamma Approximate UCL (use when n>=50)				0.58		Gamma Adjusted UCL (use when n<50)				0.58	
1176												
1177	Lognormal GOF Test on Detected Observations Only											
1178	Shapiro Wilk Test Statistic				0.91		Shapiro Wilk GOF Test					
1179	5% Shapiro Wilk Critical Value				0.90		Detected Data appear Lognormal at 5% Significance Level					
1180	Lilliefors Test Statistic				0.16		Lilliefors GOF Test					
1181	5% Lilliefors Critical Value				0.20		Detected Data appear Lognormal at 5% Significance Level					
1182	Detected Data appear Lognormal at 5% Significance Level											
1183												
1184	Lognormal ROS Statistics Using Imputed Non-Detects											
1185	Mean in Original Scale				0.37		Mean in Log Scale				-2.94	
1186	SD in Original Scale				0.93		SD in Log Scale				1.67	
1187	95% t UCL (assumes normality of ROS data)				0.57		95% Percentile Bootstrap UCL				0.57	
1188	95% BCA Bootstrap UCL				0.66		95% Bootstrap t UCL				0.68	
1189	95% H-UCL (Log ROS)				0.44							
1190												
1191	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1192	KM Mean (logged)				-2.65		95% H-UCL (KM -Log)				0.41	
1193	KM SD (logged)				1.51		95% Critical H Value (KM-Log)				3.10	
1194	KM Standard Error of Mean (logged)				0.22							
1195												
1196	DL/2 Statistics											
1197	DL/2 Normal					DL/2 Log-Transformed						
1198	Mean in Original Scale				0.39		Mean in Log Scale				-2.69	
1199	SD in Original Scale				0.92		SD in Log Scale				1.64	
1200	95% t UCL (Assumes normality)				0.60		95% H-Stat UCL				0.53	
1201	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1202												
1203	Nonparametric Distribution Free UCL Statistics											
1204	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
1205												
1206	Suggested UCL to Use											
1207	95% KM (t) UCL				0.59		95% GROS Approximate Gamma UCL				0.58	
1208	95% Approximate Gamma KM-UCL				0.70							
1209												
1210	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1211	Recommendations are based upon data size, data distribution, and skewness.											
1212	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1213	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
1214												
1215	Benzoic Acid											
1216												
1217	General Statistics											
1218	Total Number of Observations				57		Number of Distinct Observations				54	
1219	Number of Detects				9		Number of Non-Detects				48	
1220	Number of Distinct Detects				9		Number of Distinct Non-Detects				45	
1221	Minimum Detect				0.35		Minimum Non-Detect				0.72	
1222	Maximum Detect				1.56		Maximum Non-Detect				36.3	
1223	Variance Detects				0.11		Percent Non-Detects				84.2	
1224	Mean Detects				0.68		SD Detects				0.34	
1225	Median Detects				0.61		CV Detects				0.49	
1226	Skewness Detects				2.52		Kurtosis Detects				7.20	
1227	Mean of Logged Detects				-0.45		SD of Logged Detects				0.38	
1228												
1229	Normal GOF Test on Detects Only											
1230	Shapiro Wilk Test Statistic				0.64		Shapiro Wilk GOF Test					

A	B	C	D	E	F	G	H	I	J	K	L
1231	5% Shapiro Wilk Critical Value				0.82	Detected Data Not Normal at 5% Significance Level					
1232	Lilliefors Test Statistic				0.37	Lilliefors GOF Test					
1233	5% Lilliefors Critical Value				0.29	Detected Data Not Normal at 5% Significance Level					
1234	Detected Data Not Normal at 5% Significance Level										
1235											
1236	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
1237	Mean				0.60	Standard Error of Mean				0.04	
1238	SD				0.17	95% KM (BCA) UCL				0.67	
1239	95% KM (t) UCL				0.67	95% KM (Percentile Bootstrap) UCL				0.66	
1240	95% KM (z) UCL				0.67	95% KM Bootstrap t UCL				0.66	
1241	90% KM Chebyshev UCL				0.72	95% KM Chebyshev UCL				0.78	
1242	97.5% KM Chebyshev UCL				0.86	99% KM Chebyshev UCL				1.01	
1243											
1244	Gamma GOF Tests on Detected Observations Only										
1245	A-D Test Statistic				1.16	Anderson-Darling GOF Test					
1246	5% A-D Critical Value				0.72	Detected Data Not Gamma Distributed at 5% Significance Level					
1247	K-S Test Statistic				0.32	Kolmogrov-Smirnoff GOF					
1248	5% K-S Critical Value				0.28	Detected Data Not Gamma Distributed at 5% Significance Level					
1249	Detected Data Not Gamma Distributed at 5% Significance Level										
1250											
1251	Gamma Statistics on Detected Data Only										
1252	k hat (MLE)				6.66	k star (bias corrected MLE)				4.51	
1253	Theta hat (MLE)				0.10	Theta star (bias corrected MLE)				0.15	
1254	nu hat (MLE)				119.9	nu star (bias corrected)				81.29	
1255	MLE Mean (bias corrected)				0.68	MLE Sd (bias corrected)				0.32	
1256											
1257	Gamma Kaplan-Meier (KM) Statistics										
1258	k hat (KM)				12.11	nu hat (KM)				1387	
1259	Approximate Chi Square Value (N/A, α)				1302	Adjusted Chi Square Value (N/A, β)				1299	
1260	Approximate KM-UCL (use when $n \geq 50$)				0.64	Gamma Adjusted KM-UCL (use when $n < 50$)				0.64	
1261											
1262	Gamma ROS Statistics using Imputed Non-Detects										
1263	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
1264	GROS may not be used when kstar of detected data is small such as < 0.1										
1265	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
1266	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
1267	Minimum				0.35	Mean				0.60	
1268	Maximum				1.56	Median				0.58	
1269	SD				0.13	CV				0.22	
1270	k hat (MLE)				32.56	k star (bias corrected MLE)				30.88	
1271	Theta hat (MLE)				0.014	Theta star (bias corrected MLE)				0.015	
1272	nu hat (MLE)				3714	nu star (bias corrected)				3520	
1273	MLE Mean (bias corrected)				0.60	MLE Sd (bias corrected)				0.10	
1274						Adjusted Level of Significance (β)				0.04	
1275	Approximate Chi Square Value (N/A, α)				3383	Adjusted Chi Square Value (N/A, β)				3380	
1276	Gamma Approximate UCL (use when $n \geq 50$)				0.63	Gamma Adjusted UCL (use when $n < 50$)				0.63	
1277											
1278	Lognormal GOF Test on Detected Observations Only										
1279	Shapiro Wilk Test Statistic				0.79	Shapiro Wilk GOF Test					
1280	5% Shapiro Wilk Critical Value				0.82	Detected Data Not Lognormal at 5% Significance Level					
1281	Lilliefors Test Statistic				0.29	Lilliefors GOF Test					
1282	5% Lilliefors Critical Value				0.29	Detected Data appear Lognormal at 5% Significance Level					
1283	Detected Data appear Approximate Lognormal at 5% Significance Level										
1284											
1285	Lognormal ROS Statistics Using Imputed Non-Detects										
1286	Mean in Original Scale				0.60	Mean in Log Scale				-0.51	
1287	SD in Original Scale				0.13	SD in Log Scale				0.15	
1288	95% t UCL (assumes normality of ROS data)				0.63	95% Percentile Bootstrap UCL				0.63	
1289	95% BCA Bootstrap UCL				0.65	95% Bootstrap t UCL				0.67	
1290	95% H-UCL (Log ROS)				0.62						
1291											
1292	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
1293	KM Mean (logged)				-0.54	95% H-UCL (KM -Log)				0.63	
1294	KM SD (logged)				0.24	95% Critical H Value (KM-Log)				1.71	
1295	KM Standard Error of Mean (logged)				0.074						
1296											
1297	DL/2 Statistics										
1298	DL/2 Normal					DL/2 Log-Transformed					
1299	Mean in Original Scale				1.04	Mean in Log Scale				-0.43	
1300	SD in Original Scale				2.39	SD in Log Scale				0.70	
1301	95% t UCL (Assumes normality)				1.57	95% H-Stat UCL				1.00	
1302	DL/2 is not a recommended method, provided for comparisons and historical reasons										
1303											
1304	Nonparametric Distribution Free UCL Statistics										
1305	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level										
1306											
1307	Suggested UCL to Use										
1308	95% KM (t) UCL				0.67	95% KM (% Bootstrap) UCL				0.66	
1309											
1310	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL										
1311	Recommendations are based upon data size, data distribution, and skewness.										
1312	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										

	A	B	C	D	E	F	G	H	I	J	K	L
1313	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
1314												
1315	Beryllium											
1316												
1317	General Statistics											
1318	Total Number of Observations					57	Number of Distinct Observations					52
1319	Number of Detects					56	Number of Non-Detects					1
1320	Number of Distinct Detects					51	Number of Distinct Non-Detects					1
1321	Minimum Detect					0.15	Minimum Non-Detect					0.10
1322	Maximum Detect					1.07	Maximum Non-Detect					0.10
1323	Variance Detects					0.03	Percent Non-Detects					1.75
1324	Mean Detects					0.58	SD Detects					0.18
1325	Median Detects					0.55	CV Detects					0.31
1326	Skewness Detects					0.08	Kurtosis Detects					0.03
1327	Mean of Logged Detects					-0.6	SD of Logged Detects					0.35
1328												
1329	Normal GOF Test on Detects Only											
1330	Shapiro Wilk Test Statistic					0.99	Normal GOF Test on Detected Observations Only					
1331	5% Shapiro Wilk P Value					0.98	ected Data appear Normal at 5% Significance Le					
1332	Lilliefors Test Statistic					0.07	Lilliefors GOF Test					
1333	5% Lilliefors Critical Value					0.11	ected Data appear Normal at 5% Significance Le					
1334	Detected Data appear Normal at 5% Significance Level											
1335												
1336	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1337	Mean					0.57	Standard Error of Mean					0.02
1338	SD					0.18	95% KM (BCA) UCL					0.61
1339	95% KM (t) UCL					0.61	95% KM (Percentile Bootstrap) UCL					0.61
1340	95% KM (z) UCL					0.61	95% KM Bootstrap t UCL					0.61
1341	90% KM Chebyshev UCL					0.64	95% KM Chebyshev UCL					0.68
1342	97.5% KM Chebyshev UCL					0.73	99% KM Chebyshev UCL					0.82
1343												
1344	Gamma GOF Tests on Detected Observations Only											
1345	A-D Test Statistic					0.41	Anderson-Darling GOF Test					
1346	5% A-D Critical Value					0.75	data appear Gamma Distributed at 5% Significar					
1347	K-S Test Statistic					0.08	Kolmogrov-Smirnoff GOF					
1348	5% K-S Critical Value					0.11	data appear Gamma Distributed at 5% Significar					
1349	Detected data appear Gamma Distributed at 5% Significance Level											
1350												
1351	Gamma Statistics on Detected Data Only											
1352	k hat (MLE)					9.09	k star (bias corrected MLE)					8.62
1353	Theta hat (MLE)					0.06	Theta star (bias corrected MLE)					0.06
1354	nu hat (MLE)					1019	nu star (bias corrected)					965.6
1355	MLE Mean (bias corrected)					0.58	MLE Sd (bias corrected)					0.19
1356												
1357	Gamma Kaplan-Meier (KM) Statistics											
1358	k hat (KM)					9.19	nu hat (KM)					1049
1359	Approximate Chi Square Value (N/A, α)					974.5	Adjusted Chi Square Value (N/A, β)					972.7
1360	Approximate KM-UCL (use when n>=50)					0.61	Gamma Adjusted KM-UCL (use when n<50)					0.61
1361												
1362	Gamma ROS Statistics using Imputed Non-Detects											
1363	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1364	GROS may not be used when kstar of detected data is small such as < 0.1											
1365	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1366	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
1367	Minimum					0.15	Mean					0.57
1368	Maximum					1.07	Median					0.55
1369	SD					0.18	CV					0.32
1370	k hat (MLE)					8.32	k star (bias corrected MLE)					7.90
1371	Theta hat (MLE)					0.06	Theta star (bias corrected MLE)					0.07
1372	nu hat (MLE)					949.4	nu star (bias corrected)					900.7
1373	MLE Mean (bias corrected)					0.57	MLE Sd (bias corrected)					0.20
1374							Adjusted Level of Significance (β)					0.04
1375	pproximate Chi Square Value (900.74, α)					832.1	Adjusted Chi Square Value (900.74, β)					830.4
1376	Gamma Approximate UCL (use when n>=50)					0.62	Gamma Adjusted UCL (use when n<50)					0.62
1377												
1378	Lognormal GOF Test on Detected Observations Only											
1379	Lilliefors Test Statistic					0.09	Lilliefors GOF Test					
1380	5% Lilliefors Critical Value					0.11	ected Data appear Lognormal at 5% Significance L					
1381	Detected Data appear Approximate Lognormal at 5% Significance Level											
1382												
1383	Lognormal ROS Statistics Using Imputed Non-Detects											
1384	Mean in Original Scale					0.57	Mean in Log Scale					-0.61
1385	SD in Original Scale					0.18	SD in Log Scale					0.37
1386	5 t UCL (assumes normality of ROS data)					0.61	95% Percentile Bootstrap UCL					0.61
1387	95% BCA Bootstrap UCL					0.61	95% Bootstrap t UCL					0.61
1388	95% H-UCL (Log ROS)					0.63						
1389												
1390	Ls using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1391	KM Mean (logged)					-0.62	95% H-UCL (KM -Log)					0.64
1392	KM SD (logged)					0.41	95% Critical H Value (KM-Log)					1.83
1393	KM Standard Error of Mean (logged)					0.05						
1394												

A	B	C	D	E	F	G	H	I	J	K	L
1395	DL/2 Statistics										
1396	DL/2 Normal					DL/2 Log-Transformed					
1397	Mean in Original Scale				0.57	Mean in Log Scale				-0.64	
1398	SD in Original Scale				0.19	SD in Log Scale				0.46	
1399	95% t UCL (Assumes normality)				0.61	95% H-Stat UCL				0.66	
1400	DL/2 is not a recommended method, provided for comparisons and historical reasons										
1401											
1402	Nonparametric Distribution Free UCL Statistics										
1403	Detected Data appear Normal Distributed at 5% Significance Level										
1404											
1405	Suggested UCL to Use										
1406	95% KM (t) UCL				0.61	95% KM (Percentile Bootstrap) UCL				0.61	
1407											
1408	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1409	Recommendations are based upon data size, data distribution, and skewness.										
1410	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
1411	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult										
1412											
1413	Cadmium										
1414											
1415	General Statistics										
1416	Total Number of Observations				57	Number of Distinct Observations				53	
1417	Number of Detects				21	Number of Non-Detects				36	
1418	Number of Distinct Detects				21	Number of Distinct Non-Detects				32	
1419	Minimum Detect				0.14	Minimum Non-Detect				0.31	
1420	Maximum Detect				1.36	Maximum Non-Detect				0.88	
1421	Variance Detects				0.11	Percent Non-Detects				63.1%	
1422	Mean Detects				0.44	SD Detects				0.33	
1423	Median Detects				0.36	CV Detects				0.75	
1424	Skewness Detects				1.67	Kurtosis Detects				2.35	
1425	Mean of Logged Detects				-1.01	SD of Logged Detects				0.65	
1426											
1427	Normal GOF Test on Detects Only										
1428	Shapiro Wilk Test Statistic				0.79	Shapiro Wilk GOF Test					
1429	5% Shapiro Wilk Critical Value				0.90	Detected Data Not Normal at 5% Significance Level					
1430	Lilliefors Test Statistic				0.19	Lilliefors GOF Test					
1431	5% Lilliefors Critical Value				0.19	Detected Data appear Normal at 5% Significance Level					
1432	Detected Data appear Approximate Normal at 5% Significance Level										
1433											
1434	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
1435	Mean				0.34	Standard Error of Mean				0.03	
1436	SD				0.23	95% KM (BCA) UCL				0.40	
1437	95% KM (t) UCL				0.41	95% KM (Percentile Bootstrap) UCL				0.41	
1438	95% KM (z) UCL				0.40	95% KM Bootstrap t UCL				0.42	
1439	90% KM Chebyshev UCL				0.46	95% KM Chebyshev UCL				0.51	
1440	97.5% KM Chebyshev UCL				0.58	99% KM Chebyshev UCL				0.72	
1441											
1442	Gamma GOF Tests on Detected Observations Only										
1443	A-D Test Statistic				0.56	Anderson-Darling GOF Test					
1444	5% A-D Critical Value				0.75	Detected data appear Gamma Distributed at 5% Significance Level					
1445	K-S Test Statistic				0.12	Kolmogorov-Smirnov GOF					
1446	5% K-S Critical Value				0.19	Detected data appear Gamma Distributed at 5% Significance Level					
1447	Detected data appear Gamma Distributed at 5% Significance Level										
1448											
1449	Gamma Statistics on Detected Data Only										
1450	k hat (MLE)				2.43	k star (bias corrected MLE)				2.12	
1451	Theta hat (MLE)				0.18	Theta star (bias corrected MLE)				0.21	
1452	nu hat (MLE)				102.4	nu star (bias corrected)				89.0	
1453	MLE Mean (bias corrected)				0.44	MLE Sd (bias corrected)				0.30	
1454											
1455	Gamma Kaplan-Meier (KM) Statistics										
1456	k hat (KM)				2.12	nu hat (KM)				241.8	
1457	Approximate Chi Square Value (241.78, α)				206.8	Adjusted Chi Square Value (241.78, β)				205.9	
1458	Gamma Approximate UCL (use when $n \geq 50$)				0.40	Gamma Adjusted KM-UCL (use when $n < 50$)				0.40	
1459											
1460	Gamma ROS Statistics using Imputed Non-Detects										
1461	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
1462	GROS may not be used when kstar of detected data is small such as < 0.1										
1463	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
1464	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate										
1465	Minimum				0.13	Mean				0.33	
1466	Maximum				1.36	Median				0.27	
1467	SD				0.22	CV				0.68	
1468	k hat (MLE)				4.01	k star (bias corrected MLE)				3.81	
1469	Theta hat (MLE)				0.08	Theta star (bias corrected MLE)				0.08	
1470	nu hat (MLE)				457.5	nu star (bias corrected)				434.7	
1471	MLE Mean (bias corrected)				0.33	MLE Sd (bias corrected)				0.17	
1472						Adjusted Level of Significance (β)				0.04	
1473	Approximate Chi Square Value (434.72, α)				387.4	Adjusted Chi Square Value (434.72, β)				386.2	
1474	Gamma Approximate UCL (use when $n \geq 50$)				0.37	Gamma Adjusted UCL (use when $n < 50$)				0.37	
1475											
1476	Lognormal GOF Test on Detected Observations Only										

A	B	C	D	E	F	G	H	I	J	K	L
1477	Shapiro Wilk Test Statistic				0.95	Shapiro Wilk GOF Test					
1478	5% Shapiro Wilk Critical Value				0.90	ected Data appear Lognormal at 5% Significance Level					
1479	Lilliefors Test Statistic				0.11	Lilliefors GOF Test					
1480	5% Lilliefors Critical Value				0.19	ected Data appear Lognormal at 5% Significance Level					
1481	Detected Data appear Lognormal at 5% Significance Level										
1482											
1483	Lognormal ROS Statistics Using Imputed Non-Detects										
1484	Mean in Original Scale				0.33	Mean in Log Scale				-1.20	
1485	SD in Original Scale				0.22	SD in Log Scale				0.43	
1486	95% t UCL (assumes normality of ROS data)				0.38	95% Percentile Bootstrap UCL				0.38	
1487	95% BCA Bootstrap UCL				0.39	95% Bootstrap t UCL				0.41	
1488	95% H-UCL (Log ROS)				0.36						
1489											
1490	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
1491	KM Mean (logged)				-1.22	95% H-UCL (KM -Log)				0.38	
1492	KM SD (logged)				0.53	95% Critical H Value (KM-Log)				1.90	
1493	KM Standard Error of Mean (logged)				0.10						
1494											
1495	DL/2 Statistics										
1496	DL/2 Normal					DL/2 Log-Transformed					
1497	Mean in Original Scale				0.35	Mean in Log Scale				-1.13	
1498	SD in Original Scale				0.21	SD in Log Scale				0.44	
1499	95% t UCL (Assumes normality)				0.40	95% H-Stat UCL				0.39	
1500	DL/2 is not a recommended method, provided for comparisons and historical reasons										
1501											
1502	Nonparametric Distribution Free UCL Statistics										
1503	Detected Data appear Approximate Normal Distributed at 5% Significance Level										
1504											
1505	Suggested UCL to Use										
1506	95% KM (t) UCL				0.41	95% KM (Percentile Bootstrap) UCL				0.41	
1507											
1508	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1509	Recommendations are based upon data size, data distribution, and skewness.										
1510	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
1511	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult										
1512											
1513											
1514	Calcium										
1515											
1516	General Statistics										
1517	Total Number of Observations				57	Number of Distinct Observations				53	
1518						Number of Missing Observations				0	
1519	Minimum				298	Mean				3400	
1520	Maximum				11700	Median				3200	
1521	SD				1818	Std. Error of Mean				240.7	
1522	Coefficient of Variation				0.53	Skewness				2.05	
1523											
1524	Normal GOF Test										
1525	Shapiro Wilk Test Statistic				0.86	Shapiro Wilk GOF Test					
1526	5% Shapiro Wilk P Value				7.2959E-05	Data Not Normal at 5% Significance Level					
1527	Lilliefors Test Statistic				0.17	Lilliefors GOF Test					
1528	5% Lilliefors Critical Value				0.11	Data Not Normal at 5% Significance Level					
1529	Data Not Normal at 5% Significance Level										
1530											
1531	Assuming Normal Distribution										
1532	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
1533	95% Student's-t UCL				3802	95% Adjusted-CLT UCL (Chen-1995)				3865	
1534						95% Modified-t UCL (Johnson-1978)				3813	
1535											
1536	Gamma GOF Test										
1537	A-D Test Statistic				0.65	Anderson-Darling Gamma GOF Test					
1538	5% A-D Critical Value				0.75	Data appear Gamma Distributed at 5% Significance Level					
1539	K-S Test Statistic				0.10	Kolmogorov-Smirnov Gamma GOF Test					
1540	5% K-S Critical Value				0.11	Data appear Gamma Distributed at 5% Significance Level					
1541	Detected data appear Gamma Distributed at 5% Significance Level										
1542											
1543	Gamma Statistics										
1544	k hat (MLE)				3.85	k star (bias corrected MLE)				3.66	
1545	Theta hat (MLE)				881.7	Theta star (bias corrected MLE)				927.7	
1546	nu hat (MLE)				439.5	nu star (bias corrected)				417.7	
1547	MLE Mean (bias corrected)				3400	MLE Sd (bias corrected)				1776	
1548						Approximate Chi Square Value (0.05)				371.4	
1549	Adjusted Level of Significance				0.04	Adjusted Chi Square Value				370.2	
1550											
1551	Assuming Gamma Distribution										
1552	Approximate Gamma UCL (use when n>=50)				3824	Adjusted Gamma UCL (use when n<50)				3836	
1553											
1554	Lognormal GOF Test										
1555	Shapiro Wilk Test Statistic				0.92	Shapiro Wilk Lognormal GOF Test					
1556	5% Shapiro Wilk P Value				0.002	Data Not Lognormal at 5% Significance Level					
1557	Lilliefors Test Statistic				0.11	Lilliefors Lognormal GOF Test					
1558	5% Lilliefors Critical Value				0.11	Data appear Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
1559	Data appear Approximate Lognormal at 5% Significance Level											
1560												
1561	Lognormal Statistics											
1562	Minimum of Logged Data					5.69	Mean of logged Data					7.99
1563	Maximum of Logged Data					9.36	SD of logged Data					0.56
1564												
1565	Assuming Lognormal Distribution											
1566	95% H-UCL					4031	90% Chebyshev (MVUE) UCL					4303
1567	95% Chebyshev (MVUE) UCL					4679	97.5% Chebyshev (MVUE) UCL					5201
1568	99% Chebyshev (MVUE) UCL					6227						
1569												
1570	Nonparametric Distribution Free UCL Statistics											
1571	Data appear to follow a Discernible Distribution at 5% Significance Level											
1572												
1573	Nonparametric Distribution Free UCLs											
1574	95% CLT UCL					3795	95% Jackknife UCL					3802
1575	95% Standard Bootstrap UCL					3790	95% Bootstrap-t UCL					3905
1576	95% Hall's Bootstrap UCL					4028	95% Percentile Bootstrap UCL					3805
1577	95% BCA Bootstrap UCL					3878						
1578	90% Chebyshev(Mean, Sd) UCL					4122	95% Chebyshev(Mean, Sd) UCL					4449
1579	97.5% Chebyshev(Mean, Sd) UCL					4903	99% Chebyshev(Mean, Sd) UCL					5795
1580												
1581	Suggested UCL to Use											
1582	95% Approximate Gamma UCL					3824						
1583												
1584	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1585	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
1586	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
1587	For additional insight the user may want to consult a statistician.											
1588												
1589	Cesium-137											
1590												
1591	General Statistics											
1592	Total Number of Observations					56	Number of Distinct Observations					54
1593	Number of Detects					53	Number of Non-Detects					3
1594	Number of Distinct Detects					51	Number of Distinct Non-Detects					3
1595	Minimum Detect					0.17	Minimum Non-Detect					0.007
1596	Maximum Detect					3.31	Maximum Non-Detect					0.06
1597	Variance Detects					0.25	Percent Non-Detects					5.35
1598	Mean Detects					0.74	SD Detects					0.50
1599	Median Detects					0.66	CV Detects					0.67
1600	Skewness Detects					2.94	Kurtosis Detects					12.77
1601	Mean of Logged Detects					-0.44	SD of Logged Detects					0.55
1602												
1603	Normal GOF Test on Detects Only											
1604	Shapiro Wilk Test Statistic					0.75	Normal GOF Test on Detected Observations Only					
1605	5% Shapiro Wilk P Value					4.586E-05	Detected Data Not Normal at 5% Significance Level					
1606	Lilliefors Test Statistic					0.20	Lilliefors GOF Test					
1607	5% Lilliefors Critical Value					0.12	Detected Data Not Normal at 5% Significance Level					
1608	Detected Data Not Normal at 5% Significance Level											
1609												
1610	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1611	Mean					0.70	Standard Error of Mean					0.06
1612	SD					0.51	95% KM (BCA) UCL					0.83
1613	95% KM (t) UCL					0.82	95% KM (Percentile Bootstrap) UCL					0.82
1614	95% KM (z) UCL					0.82	95% KM Bootstrap t UCL					0.86
1615	90% KM Chebyshev UCL					0.91	95% KM Chebyshev UCL					1.01
1616	97.5% KM Chebyshev UCL					1.14	99% KM Chebyshev UCL					1.39
1617												
1618	Gamma GOF Tests on Detected Observations Only											
1619	A-D Test Statistic					0.67	Anderson-Darling GOF Test					
1620	5% A-D Critical Value					0.75	data appear Gamma Distributed at 5% Significance Level					
1621	K-S Test Statistic					0.12	Kolmogrov-Smirnoff GOF					
1622	5% K-S Critical Value					0.12	Detected Data Not Gamma Distributed at 5% Significance Level					
1623	Detected data follow Appr. Gamma Distribution at 5% Significance Level											
1624												
1625	Gamma Statistics on Detected Data Only											
1626	k hat (MLE)					3.28	k star (bias corrected MLE)					3.11
1627	Theta hat (MLE)					0.22	Theta star (bias corrected MLE)					0.24
1628	nu hat (MLE)					348.5	nu star (bias corrected)					330.1
1629	MLE Mean (bias corrected)					0.74	MLE Sd (bias corrected)					0.42
1630												
1631	Gamma Kaplan-Meier (KM) Statistics											
1632	k hat (KM)					1.92	nu hat (KM)					215.4
1633	Approximate Chi Square Value (215.36, α)					182.4	Adjusted Chi Square Value (215.36, β)					181.6
1634	Approximate KM-UCL (use when n>=50)					0.83	Gamma Adjusted KM-UCL (use when n<50)					0.84
1635												
1636	Gamma ROS Statistics using Imputed Non-Detects											
1637	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1638	GROS may not be used when kstar of detected data is small such as < 0.1											
1639	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1640	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM											

	A	B	C	D	E	F	G	H	I	J	K	L
1641					Minimum	0.01					Mean	0.71
1642					Maximum	3.31					Median	0.65
1643					SD	0.51					CV	0.72
1644					k hat (MLE)	1.67					k star (bias corrected MLE)	1.59
1645					Theta hat (MLE)	0.42					Theta star (bias corrected MLE)	0.44
1646					nu hat (MLE)	187.2					nu star (bias corrected)	178.5
1647					MLE Mean (bias corrected)	0.71					MLE Sd (bias corrected)	0.56
1648											Adjusted Level of Significance (β)	0.04
1649					Approximate Chi Square Value (178.49, α)	148.6					Adjusted Chi Square Value (178.49, β)	147.9
1650					Gamma Approximate UCL (use when $n \geq 50$)	0.85					Gamma Adjusted UCL (use when $n < 50$)	0.85
1651												
1652					Lognormal GOF Test on Detected Observations Only							
1653					Lilliefors Test Statistic	0.10					Lilliefors GOF Test	
1654					5% Lilliefors Critical Value	0.12					Detected Data appear Lognormal at 5% Significance Level	
1655					Detected Data appear Lognormal at 5% Significance Level							
1656												
1657					Lognormal ROS Statistics Using Imputed Non-Detects							
1658					Mean in Original Scale	0.71					Mean in Log Scale	-0.51
1659					SD in Original Scale	0.50					SD in Log Scale	0.61
1660					95% t UCL (assumes normality of ROS data)	0.83					95% Percentile Bootstrap UCL	0.83
1661					95% BCA Bootstrap UCL	0.85					95% Bootstrap t UCL	0.87
1662					95% H-UCL (Log ROS)	0.85						
1663												
1664					UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed							
1665					KM Mean (logged)	-0.68					95% H-UCL (KM -Log)	1.42
1666					KM SD (logged)	1.13					95% Critical H Value (KM-Log)	2.53
1667					KM Standard Error of Mean (logged)	0.15						
1668												
1669					DL/2 Statistics							
1670					DL/2 Normal						DL/2 Log-Transformed	
1671					Mean in Original Scale	0.71					Mean in Log Scale	-0.66
1672					SD in Original Scale	0.51					SD in Log Scale	1.1
1673					95% t UCL (Assumes normality)	0.82					95% H-Stat UCL	1.35
1674					DL/2 is not a recommended method, provided for comparisons and historical reasons							
1675												
1676					Nonparametric Distribution Free UCL Statistics							
1677					Detected Data appear Approximate Gamma Distributed at 5% Significance Level							
1678												
1679					Suggested UCL to Use							
1680					95% KM (BCA) UCL	0.83					95% GROS Approximate Gamma UCL	0.85
1681					95% Approximate Gamma KM-UCL	0.83						
1682												
1683					Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate							
1684					Recommendations are based upon data size, data distribution, and skewness.							
1685					Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and							
1686					Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult							
1687												
1688												
1689					Chromium							
1690												
1691					General Statistics							
1692					Total Number of Observations	57					Number of Distinct Observations	55
1693											Number of Missing Observations	0
1694					Minimum	4.07					Mean	20.1
1695					Maximum	192					Median	9.24
1696					SD	32.0					Std. Error of Mean	4.24
1697					Coefficient of Variation	1.59					Skewness	3.79
1698												
1699					Normal GOF Test							
1700					Shapiro Wilk Test Statistic	0.48					Shapiro Wilk GOF Test	
1701					5% Shapiro Wilk P Value	0					Data Not Normal at 5% Significance Level	
1702					Lilliefors Test Statistic	0.33					Lilliefors GOF Test	
1703					5% Lilliefors Critical Value	0.11					Data Not Normal at 5% Significance Level	
1704					Data Not Normal at 5% Significance Level							
1705												
1706					Assuming Normal Distribution							
1707					95% Normal UCL						95% UCLs (Adjusted for Skewness)	
1708					95% Student's-t UCL	27.2					95% Adjusted-CLT UCL (Chen-1995)	29.3
1709											95% Modified-t UCL (Johnson-1978)	27.5
1710												
1711					Gamma GOF Test							
1712					A-D Test Statistic	5.67					Anderson-Darling Gamma GOF Test	
1713					5% A-D Critical Value	0.77					Data Not Gamma Distributed at 5% Significance Level	
1714					K-S Test Statistic	0.22					Kolmogrov-Smirnoff Gamma GOF Test	
1715					5% K-S Critical Value	0.12					Data Not Gamma Distributed at 5% Significance Level	
1716					Data Not Gamma Distributed at 5% Significance Level							
1717												
1718					Gamma Statistics							
1719					k hat (MLE)	1.13					k star (bias corrected MLE)	1.08
1720					Theta hat (MLE)	17.7					Theta star (bias corrected MLE)	18.5
1721					nu hat (MLE)	129.4					nu star (bias corrected)	124
1722					MLE Mean (bias corrected)	20.1					MLE Sd (bias corrected)	19.3

	A	B	C	D	E	F	G	H	I	J	K	L
1723							Approximate Chi Square Value (0.05)				99.2	
1724	Adjusted Level of Significance					0.04	Adjusted Chi Square Value				98.6	
1725												
1726	Assuming Gamma Distribution											
1727	Approximate Gamma UCL (use when n>=50))					25.14	Adjusted Gamma UCL (use when n<50)				25.2	
1728												
1729	Lognormal GOF Test											
1730	Shapiro Wilk Test Statistic					0.84	Shapiro Wilk Lognormal GOF Test					
1731	5% Shapiro Wilk P Value					7.4112E-05	Data Not Lognormal at 5% Significance Level					
1732	Lilliefors Test Statistic					0.17	Lilliefors Lognormal GOF Test					
1733	5% Lilliefors Critical Value					0.11	Data Not Lognormal at 5% Significance Level					
1734	Data Not Lognormal at 5% Significance Level											
1735												
1736	Lognormal Statistics											
1737	Minimum of Logged Data					1.40	Mean of logged Data				2.50	
1738	Maximum of Logged Data					5.25	SD of logged Data				0.83	
1739												
1740	Assuming Lognormal Distribution											
1741	95% H-UCL					21.84	90% Chebyshev (MVUE) UCL				23.4	
1742	95% Chebyshev (MVUE) UCL					26.3	97.5% Chebyshev (MVUE) UCL				30.34	
1743	99% Chebyshev (MVUE) UCL					38.2						
1744												
1745	Nonparametric Distribution Free UCL Statistics											
1746	Data do not follow a Discernible Distribution (0.05)											
1747												
1748	Nonparametric Distribution Free UCLs											
1749	95% CLT UCL					27.1	95% Jackknife UCL				27.2	
1750	95% Standard Bootstrap UCL					27.1	95% Bootstrap-t UCL				31.6	
1751	95% Hall's Bootstrap UCL					29.5	95% Percentile Bootstrap UCL				27.7	
1752	95% BCA Bootstrap UCL					29.6						
1753	90% Chebyshev(Mean, Sd) UCL					32.8	95% Chebyshev(Mean, Sd) UCL				38.6	
1754	97.5% Chebyshev(Mean, Sd) UCL					46.6	99% Chebyshev(Mean, Sd) UCL				62.3	
1755												
1756	Suggested UCL to Use											
1757	95% Chebyshev (Mean, Sd) UCL					38.6						
1758												
1759	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1760	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh											
1761	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
1762	For additional insight the user may want to consult a statistician.											
1763												
1764	Chrysene											
1765												
1766	General Statistics											
1767	Total Number of Observations					57	Number of Distinct Observations				56	
1768	Number of Detects					32	Number of Non-Detects				25	
1769	Number of Distinct Detects					31	Number of Distinct Non-Detects				25	
1770	Minimum Detect					0.014	Minimum Non-Detect				0.03	
1771	Maximum Detect					12.3	Maximum Non-Detect				0.40	
1772	Variance Detects					7.47	Percent Non-Detects				43.8	
1773	Mean Detects					1.43	SD Detects				2.73	
1774	Median Detects					0.10	CV Detects				1.91	
1775	Skewness Detects					2.62	Kurtosis Detects				7.57	
1776	Mean of Logged Detects					-1.57	SD of Logged Detects				2.11	
1777												
1778	Normal GOF Test on Detects Only											
1779	Shapiro Wilk Test Statistic					0.59	Shapiro Wilk GOF Test					
1780	5% Shapiro Wilk Critical Value					0.93	Detected Data Not Normal at 5% Significance Level					
1781	Lilliefors Test Statistic					0.33	Lilliefors GOF Test					
1782	5% Lilliefors Critical Value					0.15	Detected Data Not Normal at 5% Significance Level					
1783	Detected Data Not Normal at 5% Significance Level											
1784												
1785	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1786	Mean					0.81	Standard Error of Mean				0.28	
1787	SD					2.13	95% KM (BCA) UCL				1.30	
1788	95% KM (t) UCL					1.29	95% KM (Percentile Bootstrap) UCL				1.30	
1789	95% KM (z) UCL					1.28	95% KM Bootstrap t UCL				1.66	
1790	90% KM Chebyshev UCL					1.67	95% KM Chebyshev UCL				2.06	
1791	97.5% KM Chebyshev UCL					2.60	99% KM Chebyshev UCL				3.67	
1792												
1793	Gamma GOF Tests on Detected Observations Only											
1794	A-D Test Statistic					2.22	Anderson-Darling GOF Test					
1795	5% A-D Critical Value					0.84	Detected Data Not Gamma Distributed at 5% Significance Level					
1796	K-S Test Statistic					0.23	Kolmogrov-Smirnoff GOF					
1797	5% K-S Critical Value					0.16	Detected Data Not Gamma Distributed at 5% Significance Level					
1798	Detected Data Not Gamma Distributed at 5% Significance Level											
1799												
1800	Gamma Statistics on Detected Data Only											
1801	k hat (MLE)					0.34	k star (bias corrected MLE)				0.33	
1802	Theta hat (MLE)					4.11	Theta star (bias corrected MLE)				4.26	
1803	nu hat (MLE)					22.24	nu star (bias corrected)				21.5	
1804	MLE Mean (bias corrected)					1.43	MLE Sd (bias corrected)				2.47	

A	B	C	D	E	F	G	H	I	J	K	L
1805											
1806	Gamma Kaplan-Meier (KM) Statistics										
1807	k hat (KM)			0.14		nu hat (KM)			16.7		
1808	Approximate Chi Square Value (16.71, α)				8.46		Adjusted Chi Square Value (16.71, β)				8.31
1809	Approximate KM-UCL (use when $n \geq 50$)				1.61		Gamma Adjusted KM-UCL (use when $n < 50$)				1.64
1810											
1811	Gamma ROS Statistics using Imputed Non-Detects										
1812	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
1813	GROS may not be used when kstar of detected data is small such as < 0.1										
1814	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
1815	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
1816	Minimum			0.01		Mean			0.80		
1817	Maximum			12.3		Median			0.02		
1818	SD			2.15		CV			2.66		
1819	k hat (MLE)			0.26		k star (bias corrected MLE)			0.26		
1820	Theta hat (MLE)			3.08		Theta star (bias corrected MLE)			3.11		
1821	nu hat (MLE)			29.84		nu star (bias corrected)			29.6		
1822	MLE Mean (bias corrected)			0.80		MLE Sd (bias corrected)			1.58		
1823						Adjusted Level of Significance (β)			0.04		
1824	Approximate Chi Square Value (29.61, α)				18.14		Adjusted Chi Square Value (29.61, β)				17.9
1825	Gamma Approximate UCL (use when $n \geq 50$)				1.31		Gamma Adjusted UCL (use when $n < 50$)				1.33
1826											
1827	Lognormal GOF Test on Detected Observations Only										
1828	Shapiro Wilk Test Statistic			0.88		Shapiro Wilk GOF Test					
1829	5% Shapiro Wilk Critical Value			0.93		Detected Data Not Lognormal at 5% Significance Level					
1830	Lilliefors Test Statistic			0.15		Lilliefors GOF Test					
1831	5% Lilliefors Critical Value			0.15		Detected Data appear Lognormal at 5% Significance Level					
1832	Detected Data appear Approximate Lognormal at 5% Significance Level										
1833											
1834	Lognormal ROS Statistics Using Imputed Non-Detects										
1835	Mean in Original Scale			0.81		Mean in Log Scale			-2.43		
1836	SD in Original Scale			2.15		SD in Log Scale			1.85		
1837	95% t UCL (assumes normality of ROS data)			1.29		95% Percentile Bootstrap UCL			1.29		
1838	95% BCA Bootstrap UCL			1.47		95% Bootstrap t UCL			1.52		
1839	95% H-UCL (Log ROS)			1.18							
1840											
1841	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
1842	KM Mean (logged)			-2.46		95% H-UCL (KM -Log)			1.19		
1843	KM SD (logged)			1.86		95% Critical H Value (KM-Log)			3.58		
1844	KM Standard Error of Mean (logged)			0.25							
1845											
1846	DL/2 Statistics										
1847	DL/2 Normal				DL/2 Log-Transformed						
1848	Mean in Original Scale			0.82		Mean in Log Scale			-2.43		
1849	SD in Original Scale			2.15		SD in Log Scale			1.89		
1850	95% t UCL (Assumes normality)			1.29		95% H-Stat UCL			1.30		
1851	DL/2 is not a recommended method, provided for comparisons and historical reasons										
1852											
1853	Nonparametric Distribution Free UCL Statistics										
1854	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level										
1855											
1856	Suggested UCL to Use										
1857	99% KM (Chebyshev) UCL			3.67							
1858											
1859	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1860	Recommendations are based upon data size, data distribution, and skewness.										
1861	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
1862	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult										
1863											
1864											
1865	Cobalt										
1866											
1867	General Statistics										
1868	Total Number of Observations			57		Number of Distinct Observations			51		
1869						Number of Missing Observations			0		
1870	Minimum			0.89		Mean			2.52		
1871	Maximum			4.57		Median			2.42		
1872	SD			0.86		Std. Error of Mean			0.11		
1873	Coefficient of Variation			0.34		Skewness			0.38		
1874											
1875	Normal GOF Test										
1876	Shapiro Wilk Test Statistic			0.96		Shapiro Wilk GOF Test					
1877	5% Shapiro Wilk P Value			0.24		Data appear Normal at 5% Significance Level					
1878	Lilliefors Test Statistic			0.08		Lilliefors GOF Test					
1879	5% Lilliefors Critical Value			0.11		Data appear Normal at 5% Significance Level					
1880	Data appear Normal at 5% Significance Level										
1881											
1882	Assuming Normal Distribution										
1883	95% Normal UCL				95% UCLs (Adjusted for Skewness)						
1884	95% Student's-t UCL			2.71		95% Adjusted-CLT UCL (Chen-1995)			2.71		
1885						95% Modified-t UCL (Johnson-1978)			2.71		
1886											

A	B	C	D	E	F	G	H	I	J	K	L
1887	Gamma GOF Test										
1888	A-D Test Statistic				0.25	Anderson-Darling Gamma GOF Test					
1889	5% A-D Critical Value				0.75	data appear Gamma Distributed at 5% Significance Level					
1890	K-S Test Statistic				0.07	Kolmogrov-Smirnoff Gamma GOF Test					
1891	5% K-S Critical Value				0.11	data appear Gamma Distributed at 5% Significance Level					
1892	Detected data appear Gamma Distributed at 5% Significance Level										
1893											
1894	Gamma Statistics										
1895	k hat (MLE)				8.25	k star (bias corrected MLE)				7.83	
1896	Theta hat (MLE)				0.30	Theta star (bias corrected MLE)				0.32	
1897	nu hat (MLE)				941.5	nu star (bias corrected)				893.3	
1898	MLE Mean (bias corrected)				2.52	MLE Sd (bias corrected)				0.90	
1899						Approximate Chi Square Value (0.05)				824.9	
1900	Adjusted Level of Significance				0.04	Adjusted Chi Square Value				823.2	
1901											
1902	Assuming Gamma Distribution										
1903	Approximate Gamma UCL (use when n>=50))				2.73	Adjusted Gamma UCL (use when n<50)				2.73	
1904											
1905	Lognormal GOF Test										
1906	Shapiro Wilk Test Statistic				0.96	Shapiro Wilk Lognormal GOF Test					
1907	5% Shapiro Wilk P Value				0.13	Data appear Lognormal at 5% Significance Level					
1908	Lilliefors Test Statistic				0.08	Lilliefors Lognormal GOF Test					
1909	5% Lilliefors Critical Value				0.11	Data appear Lognormal at 5% Significance Level					
1910	Data appear Lognormal at 5% Significance Level										
1911											
1912	Lognormal Statistics										
1913	Minimum of Logged Data				-0.11	Mean of logged Data				0.86	
1914	Maximum of Logged Data				1.52	SD of logged Data				0.36	
1915											
1916	Assuming Lognormal Distribution										
1917	95% H-UCL				2.76	90% Chebyshev (MVUE) UCL				2.91	
1918	95% Chebyshev (MVUE) UCL				3.08	97.5% Chebyshev (MVUE) UCL				3.32	
1919	99% Chebyshev (MVUE) UCL				3.78						
1920											
1921	Nonparametric Distribution Free UCL Statistics										
1922	Data appear to follow a Discernible Distribution at 5% Significance Level										
1923											
1924	Nonparametric Distribution Free UCLs										
1925	95% CLT UCL				2.71	95% Jackknife UCL				2.71	
1926	95% Standard Bootstrap UCL				2.71	95% Bootstrap-t UCL				2.72	
1927	95% Hall's Bootstrap UCL				2.72	95% Percentile Bootstrap UCL				2.71	
1928	95% BCA Bootstrap UCL				2.72						
1929	90% Chebyshev(Mean, Sd) UCL				2.86	95% Chebyshev(Mean, Sd) UCL				3.02	
1930	97.5% Chebyshev(Mean, Sd) UCL				3.23	99% Chebyshev(Mean, Sd) UCL				3.66	
1931											
1932	Suggested UCL to Use										
1933	95% Student's-t UCL				2.71						
1934											
1935	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1936	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh (2003). However, simulations results will not cover all Real World data sets										
1937	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets										
1938	For additional insight the user may want to consult a statistician.										
1939											
1940											
1941	Copper										
1942											
1943	General Statistics										
1944	Total Number of Observations				57	Number of Distinct Observations				55	
1945						Number of Missing Observations				0	
1946	Minimum				1.79	Mean				145.1	
1947	Maximum				4870	Median				6.88	
1948	SD				731.2	Std. Error of Mean				96.8	
1949	Coefficient of Variation				5.04	Skewness				5.79	
1950											
1951	Normal GOF Test										
1952	Shapiro Wilk Test Statistic				0.20	Shapiro Wilk GOF Test					
1953	5% Shapiro Wilk P Value				0	Data Not Normal at 5% Significance Level					
1954	Lilliefors Test Statistic				0.49	Lilliefors GOF Test					
1955	5% Lilliefors Critical Value				0.11	Data Not Normal at 5% Significance Level					
1956	Data Not Normal at 5% Significance Level										
1957											
1958	Assuming Normal Distribution										
1959	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
1960	95% Student's-t UCL				307.1	95% Adjusted-CLT UCL (Chen-1995)				383.8	
1961						95% Modified-t UCL (Johnson-1978)				319.5	
1962											
1963	Gamma GOF Test										
1964	A-D Test Statistic				15.54	Anderson-Darling Gamma GOF Test					
1965	5% A-D Critical Value				0.87	Data Not Gamma Distributed at 5% Significance Level					
1966	K-S Test Statistic				0.40	Kolmogrov-Smirnoff Gamma GOF Test					
1967	5% K-S Critical Value				0.12	Data Not Gamma Distributed at 5% Significance Level					
1968	Data Not Gamma Distributed at 5% Significance Level										

A	B	C	D	E	F	G	H	I	J	K	L
1969											
1970	Gamma Statistics										
1971	k hat (MLE)				0.26	k star (bias corrected MLE)				0.26	
1972	Theta hat (MLE)				542.2	Theta star (bias corrected MLE)				547.1	
1973	nu hat (MLE)				30.5	nu star (bias corrected)				30.2	
1974	MLE Mean (bias corrected)				145.1	MLE Sd (bias corrected)				281.7	
1975						Approximate Chi Square Value (0.05)				18.67	
1976	Adjusted Level of Significance				0.04	Adjusted Chi Square Value				18.4	
1977											
1978	Assuming Gamma Distribution										
1979	Approximate Gamma UCL (use when n>=50)				234.9	Adjusted Gamma UCL (use when n<50)				237.9	
1980											
1981	Lognormal GOF Test										
1982	Shapiro Wilk Test Statistic				0.65	Shapiro Wilk Lognormal GOF Test					
1983	5% Shapiro Wilk P Value				1.110E-	Data Not Lognormal at 5% Significance Level					
1984	Lilliefors Test Statistic				0.22	Lilliefors Lognormal GOF Test					
1985	5% Lilliefors Critical Value				0.11	Data Not Lognormal at 5% Significance Level					
1986	Data Not Lognormal at 5% Significance Level										
1987											
1988	Lognormal Statistics										
1989	Minimum of Logged Data				0.58	Mean of logged Data				2.35	
1990	Maximum of Logged Data				8.49	SD of logged Data				1.34	
1991											
1992	Assuming Lognormal Distribution										
1993	95% H-UCL				43.2	90% Chebyshev (MVUE) UCL				42.2	
1994	95% Chebyshev (MVUE) UCL				50.0	97.5% Chebyshev (MVUE) UCL				60.8	
1995	99% Chebyshev (MVUE) UCL				82.1						
1996											
1997	Nonparametric Distribution Free UCL Statistics										
1998	Data do not follow a Discernible Distribution (0.05)										
1999											
2000	Nonparametric Distribution Free UCLs										
2001	95% CLT UCL				304.4	95% Jackknife UCL				307.1	
2002	95% Standard Bootstrap UCL				310.3	95% Bootstrap-t UCL				6434	
2003	95% Hall's Bootstrap UCL				4978	95% Percentile Bootstrap UCL				317.1	
2004	95% BCA Bootstrap UCL				411						
2005	90% Chebyshev(Mean, Sd) UCL				435.6	95% Chebyshev(Mean, Sd) UCL				567.2	
2006	97.5% Chebyshev(Mean, Sd) UCL				749.9	99% Chebyshev(Mean, Sd) UCL				1109	
2007											
2008	Suggested UCL to Use										
2009	95% Chebyshev (Mean, Sd) UCL				567.2						
2010											
2011	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
2012	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and										
2013	Singh and Singh and Singh (2003). However, simulations results will not cover all Real World data sets										
2014	For additional insight the user may want to consult a statistician.										
2015											
2016	Cyanide (Total)										
2017											
2018	General Statistics										
2019	Total Number of Observations				57	Number of Distinct Observations				56	
2020	Number of Detects				43	Number of Non-Detects				14	
2021	Number of Distinct Detects				43	Number of Distinct Non-Detects				14	
2022	Minimum Detect				0.08	Minimum Non-Detect				0.25	
2023	Maximum Detect				2.88	Maximum Non-Detect				0.38	
2024	Variance Detects				0.34	Percent Non-Detects				24.5	
2025	Mean Detects				0.66	SD Detects				0.58	
2026	Median Detects				0.47	CV Detects				0.88	
2027	Skewness Detects				2.05	Kurtosis Detects				4.62	
2028	Mean of Logged Detects				-0.71	SD of Logged Detects				0.78	
2029											
2030	Normal GOF Test on Detects Only										
2031	Shapiro Wilk Test Statistic				0.77	Shapiro Wilk GOF Test					
2032	5% Shapiro Wilk Critical Value				0.94	Detected Data Not Normal at 5% Significance Level					
2033	Lilliefors Test Statistic				0.22	Lilliefors GOF Test					
2034	5% Lilliefors Critical Value				0.13	Detected Data Not Normal at 5% Significance Level					
2035	Detected Data Not Normal at 5% Significance Level										
2036											
2037	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
2038	Mean				0.54	Standard Error of Mean				0.07	
2039	SD				0.54	95% KM (BCA) UCL				0.67	
2040	95% KM (t) UCL				0.66	95% KM (Percentile Bootstrap) UCL				0.67	
2041	95% KM (z) UCL				0.66	95% KM Bootstrap t UCL				0.69	
2042	90% KM Chebyshev UCL				0.76	95% KM Chebyshev UCL				0.86	
2043	97.5% KM Chebyshev UCL				1.00	99% KM Chebyshev UCL				1.27	
2044											
2045	Gamma GOF Tests on Detected Observations Only										
2046	A-D Test Statistic				0.72	Anderson-Darling GOF Test					
2047	5% A-D Critical Value				0.76	data appear Gamma Distributed at 5% Significance Level					
2048	K-S Test Statistic				0.12	Kolmogorov-Smirnoff GOF					
2049	5% K-S Critical Value				0.13	data appear Gamma Distributed at 5% Significance Level					
2050	Detected data appear Gamma Distributed at 5% Significance Level										

	A	B	C	D	E	F	G	H	I	J	K	L
2051												
2052	Gamma Statistics on Detected Data Only											
2053	k hat (MLE)				1.79		k star (bias corrected MLE)				1.68	
2054	Theta hat (MLE)				0.36		Theta star (bias corrected MLE)				0.39	
2055	nu hat (MLE)				154.6		nu star (bias corrected)				145.2	
2056	MLE Mean (bias corrected)				0.66		MLE Sd (bias corrected)				0.51	
2057												
2058	Gamma Kaplan-Meier (KM) Statistics											
2059	k hat (KM)				0.99		nu hat (KM)				113.7	
2060	Approximate Chi Square Value (113.73, α)				90.1		Adjusted Chi Square Value (113.73, β)				89.5	
2061	Approximate KM-UCL (use when n>=50)				0.68		Gamma Adjusted KM-UCL (use when n<50)				0.69	
2062												
2063	Gamma ROS Statistics using Imputed Non-Detects											
2064	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2065	GROS may not be used when kstar of detected data is small such as < 0.1											
2066	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2067	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2068	Minimum				0.01		Mean				0.50	
2069	Maximum				2.88		Median				0.36	
2070	SD				0.57		CV				1.14	
2071	k hat (MLE)				0.72		k star (bias corrected MLE)				0.69	
2072	Theta hat (MLE)				0.70		Theta star (bias corrected MLE)				0.72	
2073	nu hat (MLE)				82.4		nu star (bias corrected)				79.4	
2074	MLE Mean (bias corrected)				0.50		MLE Sd (bias corrected)				0.60	
2075							Adjusted Level of Significance (β)				0.04	
2076	Approximate Chi Square Value (79.40, α)				59.8		Adjusted Chi Square Value (79.40, β)				59.4	
2077	Gamma Approximate UCL (use when n>=50)				0.67		Gamma Adjusted UCL (use when n<50)				0.67	
2078												
2079	Lognormal GOF Test on Detected Observations Only											
2080	Shapiro Wilk Test Statistic				0.98		Shapiro Wilk GOF Test					
2081	5% Shapiro Wilk Critical Value				0.94		Detected Data appear Lognormal at 5% Significance Level					
2082	Lilliefors Test Statistic				0.07		Lilliefors GOF Test					
2083	5% Lilliefors Critical Value				0.13		Detected Data appear Lognormal at 5% Significance Level					
2084	Detected Data appear Lognormal at 5% Significance Level											
2085												
2086	Lognormal ROS Statistics Using Imputed Non-Detects											
2087	Mean in Original Scale				0.54		Mean in Log Scale				-0.97	
2088	SD in Original Scale				0.55		SD in Log Scale				0.81	
2089	95% t UCL (assumes normality of ROS data)				0.66		95% Percentile Bootstrap UCL				0.67	
2090	95% BCA Bootstrap UCL				0.69		95% Bootstrap t UCL				0.70	
2091	95% H-UCL (Log ROS)				0.67							
2092												
2093	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2094	KM Mean (logged)				-0.97		95% H-UCL (KM -Log)				0.68	
2095	KM SD (logged)				0.83		95% Critical H Value (KM-Log)				2.16	
2096	KM Standard Error of Mean (logged)				0.11							
2097												
2098	DL/2 Statistics											
2099	DL/2 Normal					DL/2 Log-Transformed						
2100	Mean in Original Scale				0.53		Mean in Log Scale				-0.99	
2101	SD in Original Scale				0.55		SD in Log Scale				0.84	
2102	95% t UCL (Assumes normality)				0.66		95% H-Stat UCL				0.67	
2103	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2104												
2105	Nonparametric Distribution Free UCL Statistics											
2106	Detected Data appear Gamma Distributed at 5% Significance Level											
2107												
2108	Suggested UCL to Use											
2109	95% KM (BCA) UCL				0.67		95% GROS Approximate Gamma UCL				0.67	
2110	95% Approximate Gamma KM-UCL				0.68							
2111												
2112	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2113	Recommendations are based upon data size, data distribution, and skewness.											
2114	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2115	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
2116												
2117	Di-n-butylphthalate											
2118												
2119	General Statistics											
2120	Total Number of Observations				57		Number of Distinct Observations				53	
2121	Number of Detects				10		Number of Non-Detects				47	
2122	Number of Distinct Detects				10		Number of Distinct Non-Detects				44	
2123	Minimum Detect				0.09		Minimum Non-Detect				0.36	
2124	Maximum Detect				8.07		Maximum Non-Detect				4.06	
2125	Variance Detects				5.97		Percent Non-Detects				82.4	
2126	Mean Detects				1.17		SD Detects				2.44	
2127	Median Detects				0.39		CV Detects				2.08	
2128	Skewness Detects				3.06		Kurtosis Detects				9.50	
2129	Mean of Logged Detects				-0.84		SD of Logged Detects				1.26	
2130												
2131	Normal GOF Test on Detects Only											
2132	Shapiro Wilk Test Statistic				0.47		Shapiro Wilk GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L	
2133		5% Shapiro Wilk Critical Value				0.84	Detected Data Not Normal at 5% Significance Level						
2134		Lilliefors Test Statistic				0.40	Lilliefors GOF Test						
2135		5% Lilliefors Critical Value				0.28	Detected Data Not Normal at 5% Significance Level						
2136		Detected Data Not Normal at 5% Significance Level											
2137													
2138		Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2139		Mean				0.38	Standard Error of Mean				0.14		
2140		SD				1.04	95% KM (BCA) UCL				0.70		
2141		95% KM (t) UCL				0.63	95% KM (Percentile Bootstrap) UCL				0.66		
2142		95% KM (z) UCL				0.63	95% KM Bootstrap t UCL				1.22		
2143		90% KM Chebyshev UCL				0.83	95% KM Chebyshev UCL				1.03		
2144		97.5% KM Chebyshev UCL				1.31	99% KM Chebyshev UCL				1.87		
2145													
2146		Gamma GOF Tests on Detected Observations Only											
2147		A-D Test Statistic				1.24	Anderson-Darling GOF Test						
2148		5% A-D Critical Value				0.76	Detected Data Not Gamma Distributed at 5% Significance Level						
2149		K-S Test Statistic				0.33	Kolmogrov-Smirnoff GOF						
2150		5% K-S Critical Value				0.27	Detected Data Not Gamma Distributed at 5% Significance Level						
2151		Detected Data Not Gamma Distributed at 5% Significance Level											
2152													
2153		Gamma Statistics on Detected Data Only											
2154		k hat (MLE)				0.61	k star (bias corrected MLE)				0.49		
2155		Theta hat (MLE)				1.91	Theta star (bias corrected MLE)				2.36		
2156		nu hat (MLE)				12.29	nu star (bias corrected)				9.93		
2157		MLE Mean (bias corrected)				1.17	MLE Sd (bias corrected)				1.66		
2158													
2159		Gamma Kaplan-Meier (KM) Statistics											
2160		k hat (KM)				0.13	nu hat (KM)				15.69		
2161		Approximate Chi Square Value (15.69, α)				7.74	Adjusted Chi Square Value (15.69, β)				7.60		
2162		Approximate KM-UCL (use when $n \geq 50$)				0.78	Gamma Adjusted KM-UCL (use when $n < 50$)				0.79		
2163													
2164		Gamma ROS Statistics using Imputed Non-Detects											
2165		GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2166		GROS may not be used when kstar of detected data is small such as < 0.1											
2167		For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2168		Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2169		Minimum				0.01	Mean				0.21		
2170		Maximum				8.07	Median				0.01		
2171		SD				1.07	CV				5.03		
2172		k hat (MLE)				0.28	k star (bias corrected MLE)				0.28		
2173		Theta hat (MLE)				0.74	Theta star (bias corrected MLE)				0.75		
2174		nu hat (MLE)				32.91	nu star (bias corrected)				32.5		
2175		MLE Mean (bias corrected)				0.21	MLE Sd (bias corrected)				0.40		
2176							Adjusted Level of Significance (β)				0.04		
2177		Approximate Chi Square Value (32.51, α)				20.48	Adjusted Chi Square Value (32.51, β)				20.2		
2178		Gamma Approximate UCL (use when $n \geq 50$)				0.34	Gamma Adjusted UCL (use when $n < 50$)				0.34		
2179													
2180		Lognormal GOF Test on Detected Observations Only											
2181		Shapiro Wilk Test Statistic				0.88	Shapiro Wilk GOF Test						
2182		5% Shapiro Wilk Critical Value				0.84	Detected Data appear Lognormal at 5% Significance Level						
2183		Lilliefors Test Statistic				0.22	Lilliefors GOF Test						
2184		5% Lilliefors Critical Value				0.28	Detected Data appear Lognormal at 5% Significance Level						
2185		Detected Data appear Lognormal at 5% Significance Level											
2186													
2187		Lognormal ROS Statistics Using Imputed Non-Detects											
2188		Mean in Original Scale				0.36	Mean in Log Scale				-1.52		
2189		SD in Original Scale				1.05	SD in Log Scale				0.61		
2190		95% t UCL (assumes normality of ROS data)				0.59	95% Percentile Bootstrap UCL				0.62		
2191		95% BCA Bootstrap UCL				0.80	95% Bootstrap t UCL				2.82		
2192		95% H-UCL (Log ROS)				0.30							
2193													
2194		UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2195		KM Mean (logged)				-1.49	95% H-UCL (KM -Log)				0.35		
2196		KM SD (logged)				0.73	95% Critical H Value (KM-Log)				2.06		
2197		KM Standard Error of Mean (logged)				0.19							
2198													
2199		DL/2 Statistics											
2200		DL/2 Normal					DL/2 Log-Transformed						
2201		Mean in Original Scale				0.47	Mean in Log Scale				-1.22		
2202		SD in Original Scale				1.07	SD in Log Scale				0.69		
2203		95% t UCL (Assumes normality)				0.71	95% H-Stat UCL				0.45		
2204		DL/2 is not a recommended method, provided for comparisons and historical reasons											
2205													
2206		Nonparametric Distribution Free UCL Statistics											
2207		Detected Data appear Lognormal Distributed at 5% Significance Level											
2208													
2209		Suggested UCL to Use											
2210		95% KM (BCA) UCL				0.70							
2211													
2212		Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.											
2213		Recommendations are based upon data size, data distribution, and skewness.											
2214		Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											

	A	B	C	D	E	F	G	H	I	J	K	L	
2215	ations results will not cover all Real World data sets; for additional insight the user may want to cons												
2216													
2217	Dibenz(a,h)anthracene												
2218													
2219	General Statistics												
2220	Total Number of Observations				57	Number of Distinct Observations				55			
2221	Number of Detects				8	Number of Non-Detects				49			
2222	Number of Distinct Detects				8	Number of Distinct Non-Detects				47			
2223	Minimum Detect				0.01	Minimum Non-Detect				0.03			
2224	Maximum Detect				0.94	Maximum Non-Detect				1.81			
2225	Variance Detects				0.13	Percent Non-Detects				85.9			
2226	Mean Detects				0.26	SD Detects				0.36			
2227	Median Detects				0.04	CV Detects				1.36			
2228	Skewness Detects				1.27	Kurtosis Detects				0.27			
2229	Mean of Logged Detects				-2.52	SD of Logged Detects				1.76			
2230													
2231	Normal GOF Test on Detects Only												
2232	Shapiro Wilk Test Statistic				0.75	Shapiro Wilk GOF Test							
2233	5% Shapiro Wilk Critical Value				0.81	Detected Data Not Normal at 5% Significance Level							
2234	Lilliefors Test Statistic				0.33	Lilliefors GOF Test							
2235	5% Lilliefors Critical Value				0.31	Detected Data Not Normal at 5% Significance Level							
2236	Detected Data Not Normal at 5% Significance Level												
2237													
2238	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
2239	Mean				0.05	Standard Error of Mean				0.02			
2240	SD				0.15	95% KM (BCA) UCL				0.09			
2241	95% KM (t) UCL				0.09	95% KM (Percentile Bootstrap) UCL				0.09			
2242	95% KM (z) UCL				0.09	95% KM Bootstrap t UCL				0.15			
2243	90% KM Chebyshev UCL				0.12	95% KM Chebyshev UCL				0.15			
2244	97.5% KM Chebyshev UCL				0.19	99% KM Chebyshev UCL				0.27			
2245													
2246	Gamma GOF Tests on Detected Observations Only												
2247	A-D Test Statistic				0.64	Anderson-Darling GOF Test							
2248	5% A-D Critical Value				0.76	data appear Gamma Distributed at 5% Significar							
2249	K-S Test Statistic				0.25	Kolmogrov-Smirnoff GOF							
2250	5% K-S Critical Value				0.30	data appear Gamma Distributed at 5% Significar							
2251	Detected data appear Gamma Distributed at 5% Significance Level												
2252													
2253	Gamma Statistics on Detected Data Only												
2254	k hat (MLE)				0.53	k star (bias corrected MLE)				0.41			
2255	Theta hat (MLE)				0.49	Theta star (bias corrected MLE)				0.63			
2256	nu hat (MLE)				8.48	nu star (bias corrected)				6.63			
2257	MLE Mean (bias corrected)				0.26	MLE Sd (bias corrected)				0.41			
2258													
2259	Gamma Kaplan-Meier (KM) Statistics												
2260	k hat (KM)				0.12	nu hat (KM)				14.5			
2261	Approximate Chi Square Value (14.57, α)				6.96	Adjusted Chi Square Value (14.57, β)				6.82			
2262	Approximate KM-UCL (use when n>=50)				0.11	mma Adjusted KM-UCL (use when n<50)				0.11			
2263													
2264	Gamma ROS Statistics using Imputed Non-Detects												
2265	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
2266	GROS may not be used when kstar of detected data is small such as < 0.1												
2267	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
2268	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e												
2269	Minimum				0.01	Mean				0.04			
2270	Maximum				0.94	Median				0.01			
2271	SD				0.15	CV				3.40			
2272	k hat (MLE)				0.51	k star (bias corrected MLE)				0.50			
2273	Theta hat (MLE)				0.08	Theta star (bias corrected MLE)				0.09			
2274	nu hat (MLE)				59.0	nu star (bias corrected)				57.2			
2275	MLE Mean (bias corrected)				0.04	MLE Sd (bias corrected)				0.06			
2276						Adjusted Level of Significance (β)				0.04			
2277	Approximate Chi Square Value (57.25, α)				40.8	Adjusted Chi Square Value (57.25, β)				40.5			
2278	Gamma Approximate UCL (use when n>=50)				0.06	Gamma Adjusted UCL (use when n<50)				0.06			
2279													
2280	Lognormal GOF Test on Detected Observations Only												
2281	Shapiro Wilk Test Statistic				0.86	Shapiro Wilk GOF Test							
2282	5% Shapiro Wilk Critical Value				0.81	ected Data appear Lognormal at 5% Significance L							
2283	Lilliefors Test Statistic				0.20	Lilliefors GOF Test							
2284	5% Lilliefors Critical Value				0.31	ected Data appear Lognormal at 5% Significance L							
2285	Detected Data appear Lognormal at 5% Significance Level												
2286													
2287	Lognormal ROS Statistics Using Imputed Non-Detects												
2288	Mean in Original Scale				0.05	Mean in Log Scale				-3.69			
2289	SD in Original Scale				0.15	SD in Log Scale				0.8			
2290	t UCL (assumes normality of ROS data)				0.08	95% Percentile Bootstrap UCL				0.09			
2291	95% BCA Bootstrap UCL				0.10	95% Bootstrap t UCL				0.58			
2292	95% H-UCL (Log ROS)				0.04								
2293													
2294	Ls using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
2295	KM Mean (logged)				-3.76	95% H-UCL (KM -Log)				0.04			
2296	KM SD (logged)				0.86	95% Critical H Value (KM-Log)				2.19			

	A	B	C	D	E	F	G	H	I	J	K	L
2297	KM Standard Error of Mean (logged)					0.20						
2298												
2299	DL/2 Statistics											
2300	DL/2 Normal					DL/2 Log-Transformed						
2301	Mean in Original Scale					0.084	Mean in Log Scale					-3.28
2302	SD in Original Scale					0.18	SD in Log Scale					0.97
2303	95% t UCL (Assumes normality)					0.12	95% H-Stat UCL					0.08
2304	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2305												
2306	Nonparametric Distribution Free UCL Statistics											
2307	Detected Data appear Gamma Distributed at 5% Significance Level											
2308												
2309	Suggested UCL to Use											
2310	95% KM (t) UCL					0.091	95% GROS Approximate Gamma UCL					0.064
2311	95% Approximate Gamma KM-UCL					0.11						
2312												
2313	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2314	Recommendations are based upon data size, data distribution, and skewness.											
2315	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2316	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
2317												
2318	Dibenzofuran											
2319												
2320	General Statistics											
2321	Total Number of Observations					57	Number of Distinct Observations					54
2322	Number of Detects					5	Number of Non-Detects					52
2323	Number of Distinct Detects					5	Number of Distinct Non-Detects					49
2324	Minimum Detect					0.34	Minimum Non-Detect					0.36
2325	Maximum Detect					2.94	Maximum Non-Detect					18.1
2326	Variance Detects					1.2	Percent Non-Detects					91.2
2327	Mean Detects					0.99	SD Detects					1.09
2328	Median Detects					0.52	CV Detects					1.10
2329	Skewness Detects					2.17	Kurtosis Detects					4.77
2330	Mean of Logged Detects					-0.351	SD of Logged Detects					0.83
2331												
2332	Normal GOF Test on Detects Only											
2333	Shapiro Wilk Test Statistic					0.65	Shapiro Wilk GOF Test					
2334	5% Shapiro Wilk Critical Value					0.76	Detected Data Not Normal at 5% Significance Level					
2335	Lilliefors Test Statistic					0.41	Lilliefors GOF Test					
2336	5% Lilliefors Critical Value					0.39	Detected Data Not Normal at 5% Significance Level					
2337	Detected Data Not Normal at 5% Significance Level											
2338												
2339	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2340	Mean					0.40	Standard Error of Mean					0.051
2341	SD					0.35	95% KM (BCA) UCL					0.51
2342	95% KM (t) UCL					0.49	95% KM (Percentile Bootstrap) UCL					0.50
2343	95% KM (z) UCL					0.49	95% KM Bootstrap t UCL					0.68
2344	90% KM Chebyshev UCL					0.56	95% KM Chebyshev UCL					0.63
2345	97.5% KM Chebyshev UCL					0.73	99% KM Chebyshev UCL					0.93
2346												
2347	Gamma GOF Tests on Detected Observations Only											
2348	A-D Test Statistic					0.75	Anderson-Darling GOF Test					
2349	5% A-D Critical Value					0.68	Detected Data Not Gamma Distributed at 5% Significance Level					
2350	K-S Test Statistic					0.37	Kolmogrov-Smirnoff GOF					
2351	5% K-S Critical Value					0.36	Detected Data Not Gamma Distributed at 5% Significance Level					
2352	Detected Data Not Gamma Distributed at 5% Significance Level											
2353												
2354	Gamma Statistics on Detected Data Only											
2355	k hat (MLE)					1.59	k star (bias corrected MLE)					0.77
2356	Theta hat (MLE)					0.62	Theta star (bias corrected MLE)					1.28
2357	nu hat (MLE)					15.9	nu star (bias corrected)					7.69
2358	MLE Mean (bias corrected)					0.99	MLE Sd (bias corrected)					1.13
2359												
2360	Gamma Kaplan-Meier (KM) Statistics											
2361	k hat (KM)					1.33	nu hat (KM)					152
2362	Approximate Chi Square Value (151.99, α)					124.5	Adjusted Chi Square Value (151.99, β)					123.9
2363	Approximate KM-UCL (use when n>=50)					0.49	Gamma Adjusted KM-UCL (use when n<50)					0.49
2364												
2365	Gamma ROS Statistics using Imputed Non-Detects											
2366	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2367	GROS may not be used when kstar of detected data is small such as < 0.1											
2368	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2369	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
2370	Minimum					0.01	Mean					0.09
2371	Maximum					2.94	Median					0.01
2372	SD					0.40	CV					4.21
2373	k hat (MLE)					0.35	k star (bias corrected MLE)					0.34
2374	Theta hat (MLE)					0.27	Theta star (bias corrected MLE)					0.27
2375	nu hat (MLE)					40.4	nu star (bias corrected)					39.6
2376	MLE Mean (bias corrected)					0.094	MLE Sd (bias corrected)					0.16
2377							Adjusted Level of Significance (β)					0.04
2378	Approximate Chi Square Value (39.68, α)					26.2	Adjusted Chi Square Value (39.68, β)					25.9

	A	B	C	D	E	F	G	H	I	J	K	L
2379	Gamma Approximate UCL (use when n>=50)					0.14	Gamma Adjusted UCL (use when n<50)					0.14
2380												
2381	Lognormal GOF Test on Detected Observations Only											
2382	Shapiro Wilk Test Statistic					0.81	Shapiro Wilk GOF Test					
2383	5% Shapiro Wilk Critical Value					0.76	Detected Data appear Lognormal at 5% Significance Level					
2384	Lilliefors Test Statistic					0.32	Lilliefors GOF Test					
2385	5% Lilliefors Critical Value					0.39	Detected Data appear Lognormal at 5% Significance Level					
2386	Detected Data appear Lognormal at 5% Significance Level											
2387												
2388	Lognormal ROS Statistics Using Imputed Non-Detects											
2389	Mean in Original Scale					0.31	Mean in Log Scale					-1.29
2390	SD in Original Scale					0.36	SD in Log Scale					0.38
2391	95% t UCL (assumes normality of ROS data)					0.39	95% Percentile Bootstrap UCL					0.40
2392	95% BCA Bootstrap UCL					0.45	95% Bootstrap t UCL					0.76
2393	95% H-UCL (Log ROS)					0.32						
2394												
2395	Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2396	KM Mean (logged)					-1.00	95% H-UCL (KM -Log)					0.41
2397	KM SD (logged)					0.31	95% Critical H Value (KM-Log)					1.70
2398	KM Standard Error of Mean (logged)					0.04						
2399												
2400	DL/2 Statistics											
2401	DL/2 Normal					DL/2 Log-Transformed						
2402	Mean in Original Scale					0.56	Mean in Log Scale					-1.1
2403	SD in Original Scale					1.23	SD in Log Scale					0.75
2404	95% t UCL (Assumes normality)					0.83	95% H-Stat UCL					0.54
2405	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2406												
2407	Nonparametric Distribution Free UCL Statistics											
2408	Detected Data appear Lognormal Distributed at 5% Significance Level											
2409												
2410	Suggested UCL to Use											
2411	95% KM (t) UCL					0.49	95% KM (% Bootstrap) UCL					0.50
2412												
2413	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2414	Recommendations are based upon data size, data distribution, and skewness.											
2415	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2416	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
2417												
2418	Fluoranthene											
2419												
2420	General Statistics											
2421	Total Number of Observations					57	Number of Distinct Observations					57
2422	Number of Detects					38	Number of Non-Detects					19
2423	Number of Distinct Detects					38	Number of Distinct Non-Detects					19
2424	Minimum Detect					0.01	Minimum Non-Detect					0.03
2425	Maximum Detect					79.8	Maximum Non-Detect					0.40
2426	Variance Detects					171.1	Percent Non-Detects					33.3
2427	Mean Detects					3.71	SD Detects					13.0
2428	Median Detects					0.12	CV Detects					3.52
2429	Skewness Detects					5.61	Kurtosis Detects					33.1
2430	Mean of Logged Detects					-1.37	SD of Logged Detects					2.28
2431												
2432	Normal GOF Test on Detects Only											
2433	Shapiro Wilk Test Statistic					0.30	Shapiro Wilk GOF Test					
2434	5% Shapiro Wilk Critical Value					0.93	Detected Data Not Normal at 5% Significance Level					
2435	Lilliefors Test Statistic					0.38	Lilliefors GOF Test					
2436	5% Lilliefors Critical Value					0.14	Detected Data Not Normal at 5% Significance Level					
2437	Detected Data Not Normal at 5% Significance Level											
2438												
2439	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2440	Mean					2.48	Standard Error of Mean					1.43
2441	SD					10.6	95% KM (BCA) UCL					5.39
2442	95% KM (t) UCL					4.88	95% KM (Percentile Bootstrap) UCL					5.39
2443	95% KM (z) UCL					4.84	95% KM Bootstrap t UCL					12.0
2444	90% KM Chebyshev UCL					6.78	95% KM Chebyshev UCL					8.73
2445	97.5% KM Chebyshev UCL					11.4	99% KM Chebyshev UCL					16.7
2446												
2447	Gamma GOF Tests on Detected Observations Only											
2448	A-D Test Statistic					3.47	Anderson-Darling GOF Test					
2449	5% A-D Critical Value					0.87	Detected Data Not Gamma Distributed at 5% Significance Level					
2450	K-S Test Statistic					0.24	Kolmogrov-Smirnoff GOF					
2451	5% K-S Critical Value					0.15	Detected Data Not Gamma Distributed at 5% Significance Level					
2452	Detected Data Not Gamma Distributed at 5% Significance Level											
2453												
2454	Gamma Statistics on Detected Data Only											
2455	k hat (MLE)					0.26	k star (bias corrected MLE)					0.25
2456	Theta hat (MLE)					14.1	Theta star (bias corrected MLE)					14.3
2457	nu hat (MLE)					19.9	nu star (bias corrected)					19.6
2458	MLE Mean (bias corrected)					3.71	MLE Sd (bias corrected)					7.30
2459												
2460	Gamma Kaplan-Meier (KM) Statistics											

A	B	C	D	E	F	G	H	I	J	K	L
2461	k hat (KM)				0.05	nu hat (KM)				6.18	
2462	Approximate Chi Square Value (6.18, α)				1.73	Adjusted Chi Square Value (6.18, β)				1.67	
2463	Approximate KM-UCL (use when $n \geq 50$)				8.86	Gamma Adjusted KM-UCL (use when $n < 50$)				9.18	
2464	Gamma (KM) may not be used when k hat (KM) is < 0.1										
2465											
2466	Gamma ROS Statistics using Imputed Non-Detects										
2467	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs										
2468	GROS may not be used when kstar of detected data is small such as < 0.1										
2469	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
2470	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate										
2471	Minimum				0.01	Mean				2.48	
2472	Maximum				79.8	Median				0.03	
2473	SD				10.7	CV				4.34	
2474	k hat (MLE)				0.21	k star (bias corrected MLE)				0.21	
2475	Theta hat (MLE)				11.4	Theta star (bias corrected MLE)				11.4	
2476	nu hat (MLE)				24.6	nu star (bias corrected)				24.6	
2477	MLE Mean (bias corrected)				2.48	MLE Sd (bias corrected)				5.33	
2478						Adjusted Level of Significance (β)				0.04	
2479	Approximate Chi Square Value (24.68, α)				14.3	Adjusted Chi Square Value (24.68, β)				14.1	
2480	Gamma Approximate UCL (use when $n \geq 50$)				4.26	Gamma Adjusted UCL (use when $n < 50$)				4.32	
2481											
2482	Lognormal GOF Test on Detected Observations Only										
2483	Shapiro Wilk Test Statistic				0.89	Shapiro Wilk GOF Test					
2484	5% Shapiro Wilk Critical Value				0.93	Detected Data Not Lognormal at 5% Significance Level					
2485	Lilliefors Test Statistic				0.14	Lilliefors GOF Test					
2486	5% Lilliefors Critical Value				0.14	Detected Data Not Lognormal at 5% Significance Level					
2487	Detected Data Not Lognormal at 5% Significance Level										
2488											
2489	Lognormal ROS Statistics Using Imputed Non-Detects										
2490	Mean in Original Scale				2.48	Mean in Log Scale				-2.16	
2491	SD in Original Scale				10.7	SD in Log Scale				2.17	
2492	95% t UCL (assumes normality of ROS data)				4.87	95% Percentile Bootstrap UCL				5.20	
2493	95% BCA Bootstrap UCL				6.79	95% Bootstrap t UCL				11.7	
2494	95% H-UCL (Log ROS)				4.00						
2495											
2496	DL/2 Statistics										
2497	DL/2 Normal					DL/2 Log-Transformed					
2498	Mean in Original Scale				2.49	Mean in Log Scale				-2.07	
2499	SD in Original Scale				10.7	SD in Log Scale				2.14	
2500	95% t UCL (Assumes normality)				4.87	95% H-Stat UCL				3.90	
2501	DL/2 is not a recommended method, provided for comparisons and historical reasons										
2502											
2503	Nonparametric Distribution Free UCL Statistics										
2504	Data do not follow a Discernible Distribution at 5% Significance Level										
2505											
2506	Suggested UCL to Use										
2507	99% KM (Chebyshev) UCL				16.7						
2508											
2509	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
2510	Recommendations are based upon data size, data distribution, and skewness.										
2511	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
2512	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult										
2513											
2514	Fluorene										
2515											
2516	General Statistics										
2517	Total Number of Observations				57	Number of Distinct Observations				57	
2518	Number of Detects				15	Number of Non-Detects				42	
2519	Number of Distinct Detects				15	Number of Distinct Non-Detects				42	
2520	Minimum Detect				0.01	Minimum Non-Detect				0.03	
2521	Maximum Detect				4	Maximum Non-Detect				1.81	
2522	Variance Detects				1.04	Percent Non-Detects				73.6	
2523	Mean Detects				0.53	SD Detects				1.02	
2524	Median Detects				0.09	CV Detects				1.90	
2525	Skewness Detects				3.15	Kurtosis Detects				10.8	
2526	Mean of Logged Detects				-1.98	SD of Logged Detects				1.79	
2527											
2528	Normal GOF Test on Detects Only										
2529	Shapiro Wilk Test Statistic				0.55	Shapiro Wilk GOF Test					
2530	5% Shapiro Wilk Critical Value				0.88	Detected Data Not Normal at 5% Significance Level					
2531	Lilliefors Test Statistic				0.30	Lilliefors GOF Test					
2532	5% Lilliefors Critical Value				0.22	Detected Data Not Normal at 5% Significance Level					
2533	Detected Data Not Normal at 5% Significance Level										
2534											
2535	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
2536	Mean				0.15	Standard Error of Mean				0.07	
2537	SD				0.55	95% KM (BCA) UCL				0.30	
2538	95% KM (t) UCL				0.28	95% KM (Percentile Bootstrap) UCL				0.29	
2539	95% KM (z) UCL				0.28	95% KM Bootstrap t UCL				0.51	
2540	90% KM Chebyshev UCL				0.38	95% KM Chebyshev UCL				0.48	
2541	97.5% KM Chebyshev UCL				0.63	99% KM Chebyshev UCL				0.91	
2542											

	A	B	C	D	E	F	G	H	I	J	K	L	
2543	Gamma GOF Tests on Detected Observations Only												
2544	A-D Test Statistic					0.66	Anderson-Darling GOF Test						
2545	5% A-D Critical Value					0.79	data appear Gamma Distributed at 5% Significance Level						
2546	K-S Test Statistic					0.20	Kolmogrov-Smirnoff GOF						
2547	5% K-S Critical Value					0.23	data appear Gamma Distributed at 5% Significance Level						
2548	Detected data appear Gamma Distributed at 5% Significance Level												
2549													
2550	Gamma Statistics on Detected Data Only												
2551	k hat (MLE)					0.47	k star (bias corrected MLE)					0.42	
2552	Theta hat (MLE)					1.13	Theta star (bias corrected MLE)					1.27	
2553	nu hat (MLE)					14.1	nu star (bias corrected)					12.6	
2554	MLE Mean (bias corrected)					0.53	MLE Sd (bias corrected)					0.82	
2555													
2556	Gamma Kaplan-Meier (KM) Statistics												
2557	k hat (KM)					0.07	nu hat (KM)					9.00	
2558	Approximate Chi Square Value (9.01, α)					3.33	Adjusted Chi Square Value (9.01, β)					3.24	
2559	Approximate KM-UCL (use when n>=50)					0.42	Gamma Adjusted KM-UCL (use when n<50)					0.43	
2560	Gamma (KM) may not be used when k hat (KM) is < 0.1												
2561													
2562	Gamma ROS Statistics using Imputed Non-Detects												
2563	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
2564	GROS may not be used when kstar of detected data is small such as < 0.1												
2565	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
2566	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
2567	Minimum					0.01	Mean					0.14	
2568	Maximum					4	Median					0.01	
2569	SD					0.56	CV					3.78	
2570	k hat (MLE)					0.33	k star (bias corrected MLE)					0.33	
2571	Theta hat (MLE)					0.44	Theta star (bias corrected MLE)					0.44	
2572	nu hat (MLE)					38.4	nu star (bias corrected)					37.7	
2573	MLE Mean (bias corrected)					0.14	MLE Sd (bias corrected)					0.25	
2574							Adjusted Level of Significance (β)					0.04	
2575	Approximate Chi Square Value (37.72, α)					24.6	Adjusted Chi Square Value (37.72, β)					24.3	
2576	Gamma Approximate UCL (use when n>=50)					0.22	Gamma Adjusted UCL (use when n<50)					0.23	
2577													
2578	Lognormal GOF Test on Detected Observations Only												
2579	Shapiro Wilk Test Statistic					0.94	Shapiro Wilk GOF Test						
2580	5% Shapiro Wilk Critical Value					0.88	Detected Data appear Lognormal at 5% Significance Level						
2581	Lilliefors Test Statistic					0.13	Lilliefors GOF Test						
2582	5% Lilliefors Critical Value					0.22	Detected Data appear Lognormal at 5% Significance Level						
2583	Detected Data appear Lognormal at 5% Significance Level												
2584													
2585	Lognormal ROS Statistics Using Imputed Non-Detects												
2586	Mean in Original Scale					0.15	Mean in Log Scale					-3.58	
2587	SD in Original Scale					0.56	SD in Log Scale					1.31	
2588	95% t UCL (assumes normality of ROS data)					0.27	95% Percentile Bootstrap UCL					0.28	
2589	95% BCA Bootstrap UCL					0.37	95% Bootstrap t UCL					0.54	
2590	95% H-UCL (Log ROS)					0.10							
2591													
2592	Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
2593	KM Mean (logged)					-3.51	95% H-UCL (KM -Log)					0.12	
2594	KM SD (logged)					1.32	95% Critical H Value (KM-Log)					2.87	
2595	KM Standard Error of Mean (logged)					0.22							
2596													
2597	DL/2 Statistics												
2598	DL/2 Normal						DL/2 Log-Transformed						
2599	Mean in Original Scale					0.18	Mean in Log Scale					-3.10	
2600	SD in Original Scale					0.56	SD in Log Scale					1.28	
2601	95% t UCL (Assumes normality)					0.30	95% H-Stat UCL					0.16	
2602	DL/2 is not a recommended method, provided for comparisons and historical reasons												
2603													
2604	Nonparametric Distribution Free UCL Statistics												
2605	Detected Data appear Gamma Distributed at 5% Significance Level												
2606													
2607	Suggested UCL to Use												
2608	95% KM (t) UCL					0.28	95% GROS Approximate Gamma UCL					0.22	
2609	95% Approximate Gamma KM-UCL					0.42							
2610													
2611	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
2612	Recommendations are based upon data size, data distribution, and skewness.												
2613	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
2614	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult												
2615													
2616	Indeno(1,2,3-cd)pyrene												
2617													
2618	General Statistics												
2619	Total Number of Observations					57	Number of Distinct Observations					57	
2620	Number of Detects					19	Number of Non-Detects					38	
2621	Number of Distinct Detects					19	Number of Distinct Non-Detects					38	
2622	Minimum Detect					0.01	Minimum Non-Detect					0.03	
2623	Maximum Detect					4.65	Maximum Non-Detect					1.81	
2624	Variance Detects					1.79	Percent Non-Detects					66.6	

	A	B	C	D	E	F	G	H	I	J	K	L
2625				Mean Detects	1.04					SD Detects		1.34
2626				Median Detects	0.16					CV Detects		1.28
2627				Skewness Detects	1.41					Kurtosis Detects		1.43
2628				Mean of Logged Detects	-1.16					SD of Logged Detects		1.83
2629												
2630				Normal GOF Test on Detects Only								
2631				Shapiro Wilk Test Statistic	0.78					Shapiro Wilk GOF Test		
2632				5% Shapiro Wilk Critical Value	0.90					Detected Data Not Normal at 5% Significance Level		
2633				Lilliefors Test Statistic	0.27					Lilliefors GOF Test		
2634				5% Lilliefors Critical Value	0.20					Detected Data Not Normal at 5% Significance Level		
2635				Detected Data Not Normal at 5% Significance Level								
2636												
2637				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs								
2638				Mean	0.36					Standard Error of Mean		0.12
2639				SD	0.89					95% KM (BCA) UCL		0.58
2640				95% KM (t) UCL	0.57			95% KM (Percentile Bootstrap) UCL				0.58
2641				95% KM (z) UCL	0.56					95% KM Bootstrap t UCL		0.67
2642				90% KM Chebyshev UCL	0.73					95% KM Chebyshev UCL		0.89
2643				97.5% KM Chebyshev UCL	1.12					99% KM Chebyshev UCL		1.57
2644												
2645				Gamma GOF Tests on Detected Observations Only								
2646				A-D Test Statistic	0.75					Anderson-Darling GOF Test		
2647				5% A-D Critical Value	0.80					Detected data appear Gamma Distributed at 5% Significance Level		
2648				K-S Test Statistic	0.22					Kolmogrov-Smirnoff GOF		
2649				5% K-S Critical Value	0.21					Detected Data Not Gamma Distributed at 5% Significance Level		
2650				Detected data follow Appr. Gamma Distribution at 5% Significance Level								
2651												
2652				Gamma Statistics on Detected Data Only								
2653				k hat (MLE)	0.52					k star (bias corrected MLE)		0.47
2654				Theta hat (MLE)	1.99					Theta star (bias corrected MLE)		2.19
2655				nu hat (MLE)	19.84					nu star (bias corrected)		18.00
2656				MLE Mean (bias corrected)	1.04					MLE Sd (bias corrected)		1.51
2657												
2658				Gamma Kaplan-Meier (KM) Statistics								
2659				k hat (KM)	0.17					nu hat (KM)		19.50
2660				Approximate Chi Square Value (19.51, α)	10.45					Adjusted Chi Square Value (19.51, β)		10.30
2661				Approximate KM-UCL (use when n>=50)	0.68					Gamma Adjusted KM-UCL (use when n<50)		0.69
2662												
2663				Gamma ROS Statistics using Imputed Non-Detects								
2664				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs								
2665				GROS may not be used when kstar of detected data is small such as < 0.1								
2666				For such situations, GROS method tends to yield inflated values of UCLs and BTVs								
2667				Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates								
2668				Minimum	0.01					Mean		0.35
2669				Maximum	4.65					Median		0.01
2670				SD	0.90					CV		2.55
2671				k hat (MLE)	0.28					k star (bias corrected MLE)		0.28
2672				Theta hat (MLE)	1.23					Theta star (bias corrected MLE)		1.25
2673				nu hat (MLE)	32.71					nu star (bias corrected)		32.30
2674				MLE Mean (bias corrected)	0.35					MLE Sd (bias corrected)		0.66
2675										Adjusted Level of Significance (β)		0.04
2676				Approximate Chi Square Value (32.32, α)	20.30					Adjusted Chi Square Value (32.32, β)		20.00
2677				Gamma Approximate UCL (use when n>=50)	0.56					Gamma Adjusted UCL (use when n<50)		0.57
2678												
2679				Lognormal GOF Test on Detected Observations Only								
2680				Shapiro Wilk Test Statistic	0.91					Shapiro Wilk GOF Test		
2681				5% Shapiro Wilk Critical Value	0.90					Detected Data appear Lognormal at 5% Significance Level		
2682				Lilliefors Test Statistic	0.16					Lilliefors GOF Test		
2683				5% Lilliefors Critical Value	0.20					Detected Data appear Lognormal at 5% Significance Level		
2684				Detected Data appear Lognormal at 5% Significance Level								
2685												
2686				Lognormal ROS Statistics Using Imputed Non-Detects								
2687				Mean in Original Scale	0.36					Mean in Log Scale		-2.95
2688				SD in Original Scale	0.90					SD in Log Scale		1.65
2689				95% t UCL (assumes normality of ROS data)	0.56					95% Percentile Bootstrap UCL		0.56
2690				95% BCA Bootstrap UCL	0.65					95% Bootstrap t UCL		0.66
2691				95% H-UCL (Log ROS)	0.42							
2692												
2693				DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed								
2694				KM Mean (logged)	-2.75					95% H-UCL (KM -Log)		0.40
2695				KM SD (logged)	1.55					95% Critical H Value (KM-Log)		3.15
2696				KM Standard Error of Mean (logged)	0.22							
2697												
2698				DL/2 Statistics								
2699				DL/2 Normal			DL/2 Log-Transformed					
2700				Mean in Original Scale	0.38					Mean in Log Scale		-2.73
2701				SD in Original Scale	0.90					SD in Log Scale		1.64
2702				95% t UCL (Assumes normality)	0.58					95% H-Stat UCL		0.52
2703				DL/2 is not a recommended method, provided for comparisons and historical reasons								
2704												
2705				Nonparametric Distribution Free UCL Statistics								
2706				Detected Data appear Approximate Gamma Distributed at 5% Significance Level								

	A	B	C	D	E	F	G	H	I	J	K	L
2707												
2708	Suggested UCL to Use											
2709	95% KM (t) UCL					0.57	95% GROS Approximate Gamma UCL					0.56
2710	95% Approximate Gamma KM-UCL					0.68						
2711												
2712	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2713	Recommendations are based upon data size, data distribution, and skewness.											
2714	mmendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2715	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
2716												
2717	Isopropyltoluene[4-]											
2718												
2719	General Statistics											
2720	Total Number of Observations					57	Number of Distinct Observations					46
2721	Number of Detects					24	Number of Non-Detects					33
2722	Number of Distinct Detects					22	Number of Distinct Non-Detects					24
2723	Minimum Detect					3.9900E	Minimum Non-Detect					0.001
2724	Maximum Detect					0.089	Maximum Non-Detect					0.14
2725	Variance Detects					5.8145E	Percent Non-Detects					57.8
2726	Mean Detects					0.013	SD Detects					0.024
2727	Median Detects					0.002	CV Detects					1.81
2728	Skewness Detects					2.27	Kurtosis Detects					4.44
2729	Mean of Logged Detects					-5.72	SD of Logged Detects					1.68
2730												
2731	Normal GOF Test on Detects Only											
2732	Shapiro Wilk Test Statistic					0.59	Shapiro Wilk GOF Test					
2733	5% Shapiro Wilk Critical Value					0.91	Detected Data Not Normal at 5% Significance Level					
2734	Lilliefors Test Statistic					0.32	Lilliefors GOF Test					
2735	5% Lilliefors Critical Value					0.18	Detected Data Not Normal at 5% Significance Level					
2736	Detected Data Not Normal at 5% Significance Level											
2737												
2738	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2739	Mean					0.006	Standard Error of Mean					0.002
2740	SD					0.016	95% KM (BCA) UCL					0.009
2741	95% KM (t) UCL					0.009	95% KM (Percentile Bootstrap) UCL					0.01
2742	95% KM (z) UCL					0.009	95% KM Bootstrap t UCL					0.013
2743	90% KM Chebyshev UCL					0.013	95% KM Chebyshev UCL					0.016
2744	97.5% KM Chebyshev UCL					0.024	99% KM Chebyshev UCL					0.027
2745												
2746	Gamma GOF Tests on Detected Observations Only											
2747	A-D Test Statistic					1.71	Anderson-Darling GOF Test					
2748	5% A-D Critical Value					0.81	ed Data Not Gamma Distributed at 5% Significance Level					
2749	K-S Test Statistic					0.27	Kolmogrov-Smirnoff GOF					
2750	5% K-S Critical Value					0.18	ed Data Not Gamma Distributed at 5% Significance Level					
2751	Detected Data Not Gamma Distributed at 5% Significance Level											
2752												
2753	Gamma Statistics on Detected Data Only											
2754	k hat (MLE)					0.45	k star (bias corrected MLE)					0.42
2755	Theta hat (MLE)					0.029	Theta star (bias corrected MLE)					0.03
2756	nu hat (MLE)					22.0	nu star (bias corrected)					20.5
2757	MLE Mean (bias corrected)					0.013	MLE Sd (bias corrected)					0.02
2758												
2759	Gamma Kaplan-Meier (KM) Statistics											
2760	k hat (KM)					0.13	nu hat (KM)					15.2
2761	Approximate Chi Square Value (15.21, α)					7.40	Adjusted Chi Square Value (15.21, β)					7.26
2762	Approximate KM-UCL (use when $n \geq 50$)					0.013	Gamma Adjusted KM-UCL (use when $n < 50$)					0.017
2763												
2764	Gamma ROS Statistics using Imputed Non-Detects											
2765	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2766	GROS may not be used when kstar of detected data is small such as < 0.1											
2767	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2768	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
2769	Minimum					3.9900E	Mean					0.01
2770	Maximum					0.089	Median					0.01
2771	SD					0.013	CV					1.36
2772	k hat (MLE)					0.96	k star (bias corrected MLE)					0.92
2773	Theta hat (MLE)					0.013	Theta star (bias corrected MLE)					0.017
2774	nu hat (MLE)					109.9	nu star (bias corrected)					105.5
2775	MLE Mean (bias corrected)					0.013	MLE Sd (bias corrected)					0.01
2776							Adjusted Level of Significance (β)					0.04
2777	pproximate Chi Square Value (105.49, α)					82.79	Adjusted Chi Square Value (105.49, β)					82.2
2778	Gamma Approximate UCL (use when $n \geq 50$)					0.013	Gamma Adjusted UCL (use when $n < 50$)					0.017
2779												
2780	Lognormal GOF Test on Detected Observations Only											
2781	Shapiro Wilk Test Statistic					0.90	Shapiro Wilk GOF Test					
2782	5% Shapiro Wilk Critical Value					0.91	Detected Data Not Lognormal at 5% Significance Level					
2783	Lilliefors Test Statistic					0.20	Lilliefors GOF Test					
2784	5% Lilliefors Critical Value					0.18	Detected Data Not Lognormal at 5% Significance Level					
2785	Detected Data Not Lognormal at 5% Significance Level											
2786												
2787	Lognormal ROS Statistics Using Imputed Non-Detects											
2788	Mean in Original Scale					0.006	Mean in Log Scale					-6.66

A	B	C	D	E	F	G	H	I	J	K	L
2789	SD in Original Scale				0.014	SD in Log Scale				1.39	
2790	95% t UCL (assumes normality of ROS data)				0.009	95% Percentile Bootstrap UCL				0.009	
2791	95% BCA Bootstrap UCL				0.014	95% Bootstrap t UCL				0.014	
2792	95% H-UCL (Log ROS)				0.005						
2793											
2794	DL/2 Statistics										
2795	DL/2 Normal					DL/2 Log-Transformed					
2796	Mean in Original Scale				0.007	Mean in Log Scale				-6.58	
2797	SD in Original Scale				0.014	SD in Log Scale				1.45	
2798	95% t UCL (Assumes normality)				0.014	95% H-Stat UCL				0.007	
2799	DL/2 is not a recommended method, provided for comparisons and historical reasons										
2800											
2801	Nonparametric Distribution Free UCL Statistics										
2802	Data do not follow a Discernible Distribution at 5% Significance Level										
2803											
2804	Suggested UCL to Use										
2805	95% KM (Chebyshev) UCL				0.014						
2806											
2807	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.										
2808	Recommendations are based upon data size, data distribution, and skewness.										
2809	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
2810	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult the literature.										
2811											
2812											
2813	Lead										
2814											
2815	General Statistics										
2816	Total Number of Observations				57	Number of Distinct Observations				50	
2817						Number of Missing Observations				0	
2818	Minimum				4.82	Mean				22.2	
2819	Maximum				202	Median				13	
2820	SD				32.54	Std. Error of Mean				4.31	
2821	Coefficient of Variation				1.46	Skewness				4.19	
2822											
2823	Normal GOF Test										
2824	Shapiro Wilk Test Statistic				0.46	Shapiro Wilk GOF Test					
2825	5% Shapiro Wilk P Value				0	Data Not Normal at 5% Significance Level					
2826	Lilliefors Test Statistic				0.35	Lilliefors GOF Test					
2827	5% Lilliefors Critical Value				0.11	Data Not Normal at 5% Significance Level					
2828	Data Not Normal at 5% Significance Level										
2829											
2830	Assuming Normal Distribution										
2831	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
2832	95% Student's-t UCL				29.41	95% Adjusted-CLT UCL (Chen-1995)				31.8	
2833						95% Modified-t UCL (Johnson-1978)				29.8	
2834											
2835	Gamma GOF Test										
2836	A-D Test Statistic				6.14	Anderson-Darling Gamma GOF Test					
2837	5% A-D Critical Value				0.77	Data Not Gamma Distributed at 5% Significance Level					
2838	K-S Test Statistic				0.29	Kolmogorov-Smirnoff Gamma GOF Test					
2839	5% K-S Critical Value				0.12	Data Not Gamma Distributed at 5% Significance Level					
2840	Data Not Gamma Distributed at 5% Significance Level										
2841											
2842	Gamma Statistics										
2843	k hat (MLE)				1.42	k star (bias corrected MLE)				1.36	
2844	Theta hat (MLE)				15.5	Theta star (bias corrected MLE)				16.3	
2845	nu hat (MLE)				162.6	nu star (bias corrected)				155.4	
2846	MLE Mean (bias corrected)				22.2	MLE Sd (bias corrected)				19.0	
2847						Approximate Chi Square Value (0.05)				127.6	
2848	Adjusted Level of Significance				0.045	Adjusted Chi Square Value				126.9	
2849											
2850	Assuming Gamma Distribution										
2851	Approximate Gamma UCL (use when n>=50)				27.04	Adjusted Gamma UCL (use when n<50)				27.1	
2852											
2853	Lognormal GOF Test										
2854	Shapiro Wilk Test Statistic				0.83	Shapiro Wilk Lognormal GOF Test					
2855	5% Shapiro Wilk P Value				2.3806E-05	Data Not Lognormal at 5% Significance Level					
2856	Lilliefors Test Statistic				0.22	Lilliefors Lognormal GOF Test					
2857	5% Lilliefors Critical Value				0.11	Data Not Lognormal at 5% Significance Level					
2858	Data Not Lognormal at 5% Significance Level										
2859											
2860	Lognormal Statistics										
2861	Minimum of Logged Data				1.57	Mean of logged Data				2.71	
2862	Maximum of Logged Data				5.30	SD of logged Data				0.72	
2863											
2864	Assuming Lognormal Distribution										
2865	95% H-UCL				23.84	90% Chebyshev (MVUE) UCL				25.5	
2866	95% Chebyshev (MVUE) UCL				28.34	97.5% Chebyshev (MVUE) UCL				32.2	
2867	99% Chebyshev (MVUE) UCL				39.84						
2868											
2869	Nonparametric Distribution Free UCL Statistics										
2870	Data do not follow a Discernible Distribution (0.05)										

	A	B	C	D	E	F	G	H	I	J	K	L
2871												
2872	Nonparametric Distribution Free UCLs											
2873	95% CLT UCL					29.3	95% Jackknife UCL					29.4
2874	95% Standard Bootstrap UCL					29.3	95% Bootstrap-t UCL					37.3
2875	95% Hall's Bootstrap UCL					57.5	95% Percentile Bootstrap UCL					29.4
2876	95% BCA Bootstrap UCL					31.7						
2877	90% Chebyshev(Mean, Sd) UCL					35.1	95% Chebyshev(Mean, Sd) UCL					41.0
2878	97.5% Chebyshev(Mean, Sd) UCL					49.1	99% Chebyshev(Mean, Sd) UCL					65.1
2879												
2880	Suggested UCL to Use											
2881	95% Chebyshev (Mean, Sd) UCL					41.0						
2882												
2883	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2884	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh											
2885	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
2886	For additional insight the user may want to consult a statistician.											
2887												
2888												
2889	Magnesium											
2890												
2891	General Statistics											
2892	Total Number of Observations					57	Number of Distinct Observations					40
2893							Number of Missing Observations					0
2894	Minimum					194	Mean					1246
2895	Maximum					2040	Median					1210
2896	SD					364.1	Std. Error of Mean					48.2
2897	Coefficient of Variation					0.29	Skewness					-0.053
2898												
2899	Normal GOF Test											
2900	Shapiro Wilk Test Statistic					0.96	Shapiro Wilk GOF Test					
2901	5% Shapiro Wilk P Value					0.20	Data appear Normal at 5% Significance Level					
2902	Lilliefors Test Statistic					0.10	Lilliefors GOF Test					
2903	5% Lilliefors Critical Value					0.11	Data appear Normal at 5% Significance Level					
2904	Data appear Normal at 5% Significance Level											
2905												
2906	Assuming Normal Distribution											
2907	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2908	95% Student's-t UCL					1326	95% Adjusted-CLT UCL (Chen-1995)					1325
2909							95% Modified-t UCL (Johnson-1978)					1326
2910												
2911	Gamma GOF Test											
2912	A-D Test Statistic					1.04	Anderson-Darling Gamma GOF Test					
2913	5% A-D Critical Value					0.75	Data Not Gamma Distributed at 5% Significance Level					
2914	K-S Test Statistic					0.14	Kolmogorov-Smirnov Gamma GOF Test					
2915	5% K-S Critical Value					0.11	Data Not Gamma Distributed at 5% Significance Level					
2916	Data Not Gamma Distributed at 5% Significance Level											
2917												
2918	Gamma Statistics											
2919	k hat (MLE)					9.41	k star (bias corrected MLE)					8.92
2920	Theta hat (MLE)					132.4	Theta star (bias corrected MLE)					139.5
2921	nu hat (MLE)					1073	nu star (bias corrected)					1018
2922	MLE Mean (bias corrected)					1246	MLE Sd (bias corrected)					416.9
2923							Approximate Chi Square Value (0.05)					944.8
2924	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					943
2925												
2926	Assuming Gamma Distribution											
2927	Approximate Gamma UCL (use when n>=50))					1342	Adjusted Gamma UCL (use when n<50)					1345
2928												
2929	Lognormal GOF Test											
2930	Shapiro Wilk Test Statistic					0.83	Shapiro Wilk Lognormal GOF Test					
2931	5% Shapiro Wilk P Value					3.0287E	Data Not Lognormal at 5% Significance Level					
2932	Lilliefors Test Statistic					0.17	Lilliefors Lognormal GOF Test					
2933	5% Lilliefors Critical Value					0.11	Data Not Lognormal at 5% Significance Level					
2934	Data Not Lognormal at 5% Significance Level											
2935												
2936	Lognormal Statistics											
2937	Minimum of Logged Data					5.26	Mean of logged Data					7.07
2938	Maximum of Logged Data					7.62	SD of logged Data					0.36
2939												
2940	Assuming Lognormal Distribution											
2941	95% H-UCL					1378	90% Chebyshev (MVUE) UCL					1452
2942	95% Chebyshev (MVUE) UCL					1538	97.5% Chebyshev (MVUE) UCL					1658
2943	99% Chebyshev (MVUE) UCL					1893						
2944												
2945	Nonparametric Distribution Free UCL Statistics											
2946	Data appear to follow a Discernible Distribution at 5% Significance Level											
2947												
2948	Nonparametric Distribution Free UCLs											
2949	95% CLT UCL					1325	95% Jackknife UCL					1326
2950	95% Standard Bootstrap UCL					1323	95% Bootstrap-t UCL					1324
2951	95% Hall's Bootstrap UCL					1326	95% Percentile Bootstrap UCL					1325
2952	95% BCA Bootstrap UCL					1327						

A	B	C	D	E	F	G	H	I	J	K	L
2953	90% Chebyshev(Mean, Sd) UCL				1390	95% Chebyshev(Mean, Sd) UCL				1456	
2954	97.5% Chebyshev(Mean, Sd) UCL				1547	99% Chebyshev(Mean, Sd) UCL				1726	
2955											
2956	Suggested UCL to Use										
2957	95% Student's-t UCL				1326						
2958											
2959	itions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
2960	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and										
2961	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets										
2962	For additional insight the user may want to consult a statistician.										
2963											
2964	highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may										
2965	reliable. Chen's and Johnson's methods provide adjustments for positively skewed data sets.										
2966											
2967											
2968	Manganese										
2969											
2970	General Statistics										
2971	Total Number of Observations				57	Number of Distinct Observations				57	
2972						Number of Missing Observations				0	
2973	Minimum				88.4	Mean				403.7	
2974	Maximum				893	Median				361	
2975	SD				181.5	Std. Error of Mean				24.0	
2976	Coefficient of Variation				0.45	Skewness				0.57	
2977											
2978	Normal GOF Test										
2979	Shapiro Wilk Test Statistic				0.95	Shapiro Wilk GOF Test					
2980	5% Shapiro Wilk P Value				0.08	Data appear Normal at 5% Significance Level					
2981	Lilliefors Test Statistic				0.13	Lilliefors GOF Test					
2982	5% Lilliefors Critical Value				0.11	Data Not Normal at 5% Significance Level					
2983	Data appear Approximate Normal at 5% Significance Level										
2984											
2985	Assuming Normal Distribution										
2986	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
2987	95% Student's-t UCL				443.9	95% Adjusted-CLT UCL (Chen-1995)				445.1	
2988						95% Modified-t UCL (Johnson-1978)				444.2	
2989											
2990	Gamma GOF Test										
2991	A-D Test Statistic				0.35	Anderson-Darling Gamma GOF Test					
2992	5% A-D Critical Value				0.75	data appear Gamma Distributed at 5% Significance Level					
2993	K-S Test Statistic				0.07	Kolmogrov-Smirnoff Gamma GOF Test					
2994	5% K-S Critical Value				0.11	data appear Gamma Distributed at 5% Significance Level					
2995	Detected data appear Gamma Distributed at 5% Significance Level										
2996											
2997	Gamma Statistics										
2998	k hat (MLE)				4.64	k star (bias corrected MLE)				4.40	
2999	Theta hat (MLE)				86.9	Theta star (bias corrected MLE)				91.5	
3000	nu hat (MLE)				529.2	nu star (bias corrected)				502.7	
3001	MLE Mean (bias corrected)				403.7	MLE Sd (bias corrected)				192.2	
3002						Approximate Chi Square Value (0.05)				451.7	
3003	Adjusted Level of Significance				0.04	Adjusted Chi Square Value				450.4	
3004											
3005	Assuming Gamma Distribution										
3006	Approximate Gamma UCL (use when n>=50))				449.2	Adjusted Gamma UCL (use when n<50)				450.5	
3007											
3008	Lognormal GOF Test										
3009	Shapiro Wilk Test Statistic				0.95	Shapiro Wilk Lognormal GOF Test					
3010	5% Shapiro Wilk P Value				0.05	Data appear Lognormal at 5% Significance Level					
3011	Lilliefors Test Statistic				0.09	Lilliefors Lognormal GOF Test					
3012	5% Lilliefors Critical Value				0.11	Data appear Lognormal at 5% Significance Level					
3013	Data appear Lognormal at 5% Significance Level										
3014											
3015	Lognormal Statistics										
3016	Minimum of Logged Data				4.48	Mean of logged Data				5.88	
3017	Maximum of Logged Data				6.79	SD of logged Data				0.50	
3018											
3019	Assuming Lognormal Distribution										
3020	95% H-UCL				465.3	90% Chebyshev (MVUE) UCL				494.8	
3021	95% Chebyshev (MVUE) UCL				533.8	97.5% Chebyshev (MVUE) UCL				587.9	
3022	99% Chebyshev (MVUE) UCL				694.1						
3023											
3024	Nonparametric Distribution Free UCL Statistics										
3025	Data appear to follow a Discernible Distribution at 5% Significance Level										
3026											
3027	Nonparametric Distribution Free UCLs										
3028	95% CLT UCL				443.2	95% Jackknife UCL				443.9	
3029	95% Standard Bootstrap UCL				443.5	95% Bootstrap-t UCL				446.1	
3030	95% Hall's Bootstrap UCL				446.4	95% Percentile Bootstrap UCL				444	
3031	95% BCA Bootstrap UCL				449.3						
3032	90% Chebyshev(Mean, Sd) UCL				475.8	95% Chebyshev(Mean, Sd) UCL				508.4	
3033	97.5% Chebyshev(Mean, Sd) UCL				553.8	99% Chebyshev(Mean, Sd) UCL				642.8	
3034											

	A	B	C	D	E	F	G	H	I	J	K	L
3035	Suggested UCL to Use											
3036	95% Student's-t UCL					443.9						
3037												
3038	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3039	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
3040	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
3041	For additional insight the user may want to consult a statistician.											
3042												
3043												
3044	Mercury											
3045												
3046	General Statistics											
3047	Total Number of Observations					57	Number of Distinct Observations					54
3048							Number of Missing Observations					0
3049	Minimum					0.008	Mean					0.89
3050	Maximum					25	Median					0.07
3051	SD					3.80	Std. Error of Mean					0.50
3052	Coefficient of Variation					4.27	Skewness					5.61
3053												
3054	Normal GOF Test											
3055	Shapiro Wilk Test Statistic					0.25	Shapiro Wilk GOF Test					
3056	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level					
3057	Lilliefors Test Statistic					0.43	Lilliefors GOF Test					
3058	5% Lilliefors Critical Value					0.11	Data Not Normal at 5% Significance Level					
3059	Data Not Normal at 5% Significance Level											
3060												
3061	Assuming Normal Distribution											
3062	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
3063	95% Student's-t UCL					1.73	95% Adjusted-CLT UCL (Chen-1995)					2.11
3064							95% Modified-t UCL (Johnson-1978)					1.79
3065												
3066	Gamma GOF Test											
3067	A-D Test Statistic					8.83	Anderson-Darling Gamma GOF Test					
3068	5% A-D Critical Value					0.86	Data Not Gamma Distributed at 5% Significance Level					
3069	K-S Test Statistic					0.28	Kolmogorov-Smirnov Gamma GOF Test					
3070	5% K-S Critical Value					0.12	Data Not Gamma Distributed at 5% Significance Level					
3071	Data Not Gamma Distributed at 5% Significance Level											
3072												
3073	Gamma Statistics											
3074	k hat (MLE)					0.30	k star (bias corrected MLE)					0.30
3075	Theta hat (MLE)					2.90	Theta star (bias corrected MLE)					2.95
3076	nu hat (MLE)					34.9	nu star (bias corrected)					34.3
3077	MLE Mean (bias corrected)					0.89	MLE Sd (bias corrected)					1.62
3078							Approximate Chi Square Value (0.05)					21.9
3079	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					21.7
3080												
3081	Assuming Gamma Distribution											
3082	Approximate Gamma UCL (use when n>=50)					1.39	Adjusted Gamma UCL (use when n<50)					1.41
3083												
3084	Lognormal GOF Test											
3085	Shapiro Wilk Test Statistic					0.88	Shapiro Wilk Lognormal GOF Test					
3086	5% Shapiro Wilk P Value					1.4550E	Data Not Lognormal at 5% Significance Level					
3087	Lilliefors Test Statistic					0.15	Lilliefors Lognormal GOF Test					
3088	5% Lilliefors Critical Value					0.11	Data Not Lognormal at 5% Significance Level					
3089	Data Not Lognormal at 5% Significance Level											
3090												
3091	Lognormal Statistics											
3092	Minimum of Logged Data					-4.76	Mean of logged Data					-2.36
3093	Maximum of Logged Data					3.21	SD of logged Data					1.60
3094												
3095	Assuming Lognormal Distribution											
3096	95% H-UCL					0.67	90% Chebyshev (MVUE) UCL					0.60
3097	95% Chebyshev (MVUE) UCL					0.73	97.5% Chebyshev (MVUE) UCL					0.91
3098	99% Chebyshev (MVUE) UCL					1.26						
3099												
3100	Nonparametric Distribution Free UCL Statistics											
3101	Data do not follow a Discernible Distribution (0.05)											
3102												
3103	Nonparametric Distribution Free UCLs											
3104	95% CLT UCL					1.71	95% Jackknife UCL					1.73
3105	95% Standard Bootstrap UCL					1.71	95% Bootstrap-t UCL					8.79
3106	95% Hall's Bootstrap UCL					6.76	95% Percentile Bootstrap UCL					1.81
3107	95% BCA Bootstrap UCL					2.21						
3108	90% Chebyshev(Mean, Sd) UCL					2.40	95% Chebyshev(Mean, Sd) UCL					3.08
3109	97.5% Chebyshev(Mean, Sd) UCL					4.03	99% Chebyshev(Mean, Sd) UCL					5.90
3110												
3111	Suggested UCL to Use											
3112	95% Chebyshev (Mean, Sd) UCL					3.08						
3113												
3114	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3115	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
3116	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											

	A	B	C	D	E	F	G	H	I	J	K	L
3117	For additional insight the user may want to consult a statistician.											
3118												
3119	Methylene Chloride											
3120												
3121	General Statistics											
3122	Total Number of Observations				57	Number of Distinct Observations				55		
3123	Number of Detects				7	Number of Non-Detects				50		
3124	Number of Distinct Detects				7	Number of Distinct Non-Detects				49		
3125	Minimum Detect				0.002	Minimum Non-Detect				0.005		
3126	Maximum Detect				0.005	Maximum Non-Detect				0.014		
3127	Variance Detects				1.1358E	Percent Non-Detects				87.7%		
3128	Mean Detects				0.003	SD Detects				0.001		
3129	Median Detects				0.003	CV Detects				0.28		
3130	Skewness Detects				1.11	Kurtosis Detects				0.70		
3131	Mean of Logged Detects				-5.60	SD of Logged Detects				0.26		
3132												
3133	Normal GOF Test on Detects Only											
3134	Shapiro Wilk Test Statistic				0.90	Shapiro Wilk GOF Test						
3135	5% Shapiro Wilk Critical Value				0.80	Detected Data appear Normal at 5% Significance Level						
3136	Lilliefors Test Statistic				0.21	Lilliefors GOF Test						
3137	5% Lilliefors Critical Value				0.33	Detected Data appear Normal at 5% Significance Level						
3138	Detected Data appear Normal at 5% Significance Level											
3139												
3140	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3141	Mean				0.003	Standard Error of Mean				3.2202E		
3142	SD				8.7203E	95% KM (BCA) UCL				0.004		
3143	95% KM (t) UCL				0.004	95% KM (Percentile Bootstrap) UCL				0.004		
3144	95% KM (z) UCL				0.004	95% KM Bootstrap t UCL				0.004		
3145	90% KM Chebyshev UCL				0.004	95% KM Chebyshev UCL				0.005		
3146	97.5% KM Chebyshev UCL				0.005	99% KM Chebyshev UCL				0.006		
3147												
3148	Gamma GOF Tests on Detected Observations Only											
3149	A-D Test Statistic				0.27	Anderson-Darling GOF Test						
3150	5% A-D Critical Value				0.70	Detected data appear Gamma Distributed at 5% Significance Level						
3151	K-S Test Statistic				0.18	Kolmogrov-Smirnoff GOF						
3152	5% K-S Critical Value				0.31	Detected data appear Gamma Distributed at 5% Significance Level						
3153	Detected data appear Gamma Distributed at 5% Significance Level											
3154												
3155	Gamma Statistics on Detected Data Only											
3156	k hat (MLE)				16.14	k star (bias corrected MLE)				9.34		
3157	Theta hat (MLE)				2.3389E	Theta star (bias corrected MLE)				4.0513E		
3158	nu hat (MLE)				226.6	nu star (bias corrected)				130.8		
3159	MLE Mean (bias corrected)				0.003	MLE Sd (bias corrected)				0.001		
3160												
3161	Gamma Kaplan-Meier (KM) Statistics											
3162	k hat (KM)				17.5	nu hat (KM)				1998		
3163	Approximate Chi Square Value (N/A, α)				1895	Adjusted Chi Square Value (N/A, β)				1893		
3164	Approximate KM-UCL (use when n>=50)				0.003	Gamma Adjusted KM-UCL (use when n<50)				0.003		
3165												
3166	Gamma ROS Statistics using Imputed Non-Detects											
3167	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3168	GROS may not be used when kstar of detected data is small such as < 0.1											
3169	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3170	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3171	Minimum				0.002	Mean				0.009		
3172	Maximum				0.01	Median				0.01		
3173	SD				0.002	CV				0.22		
3174	k hat (MLE)				11.6	k star (bias corrected MLE)				11		
3175	Theta hat (MLE)				7.9653E	Theta star (bias corrected MLE)				8.3989E		
3176	nu hat (MLE)				1322	nu star (bias corrected)				1254		
3177	MLE Mean (bias corrected)				0.009	MLE Sd (bias corrected)				0.002		
3178						Adjusted Level of Significance (β)				0.04		
3179	Approximate Chi Square Value (N/A, α)				1173	Adjusted Chi Square Value (N/A, β)				1171		
3180	Gamma Approximate UCL (use when n>=50)				0.009	Gamma Adjusted UCL (use when n<50)				0.009		
3181												
3182	Lognormal GOF Test on Detected Observations Only											
3183	Shapiro Wilk Test Statistic				0.95	Shapiro Wilk GOF Test						
3184	5% Shapiro Wilk Critical Value				0.80	Detected Data appear Lognormal at 5% Significance Level						
3185	Lilliefors Test Statistic				0.17	Lilliefors GOF Test						
3186	5% Lilliefors Critical Value				0.33	Detected Data appear Lognormal at 5% Significance Level						
3187	Detected Data appear Lognormal at 5% Significance Level											
3188												
3189	Lognormal ROS Statistics Using Imputed Non-Detects											
3190	Mean in Original Scale				0.003	Mean in Log Scale				-5.64		
3191	SD in Original Scale				3.6927E	SD in Log Scale				0.09		
3192	5% t UCL (assumes normality of ROS data)				0.003	95% Percentile Bootstrap UCL				0.003		
3193	95% BCA Bootstrap UCL				0.003	95% Bootstrap t UCL				0.003		
3194	95% H-UCL (Log ROS)				N/A							
3195												
3196	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
3197	KM Mean (logged)				-5.63	95% H-UCL (KM -Log)				0.003		
3198	KM SD (logged)				0.22	95% Critical H Value (KM-Log)				1.72		

	A	B	C	D	E	F	G	H	I	J	K	L
3199	KM Standard Error of Mean (logged)					0.084						
3200												
3201	DL/2 Statistics											
3202	DL/2 Normal					DL/2 Log-Transformed						
3203	Mean in Original Scale					0.003	Mean in Log Scale					-5.67
3204	SD in Original Scale					5.73245	SD in Log Scale					0.15
3205	95% t UCL (Assumes normality)					0.003	95% H-Stat UCL					0.003
3206	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3207												
3208	Nonparametric Distribution Free UCL Statistics											
3209	Detected Data appear Normal Distributed at 5% Significance Level											
3210												
3211	Suggested UCL to Use											
3212	95% KM (t) UCL					0.004	95% KM (Percentile Bootstrap) UCL					0.004
3213												
3214	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3215	Recommendations are based upon data size, data distribution, and skewness.											
3216	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3217	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
3218												
3219	Methylnaphthalene[2-]											
3220												
3221	General Statistics											
3222	Total Number of Observations					57	Number of Distinct Observations					54
3223	Number of Detects					7	Number of Non-Detects					50
3224	Number of Distinct Detects					7	Number of Distinct Non-Detects					47
3225	Minimum Detect					0.02	Minimum Non-Detect					0.03
3226	Maximum Detect					1.3	Maximum Non-Detect					1.81
3227	Variance Detects					0.20	Percent Non-Detects					87.7
3228	Mean Detects					0.29	SD Detects					0.45
3229	Median Detects					0.15	CV Detects					1.54
3230	Skewness Detects					2.49	Kurtosis Detects					6.41
3231	Mean of Logged Detects					-2.01	SD of Logged Detects					1.33
3232												
3233	Normal GOF Test on Detects Only											
3234	Shapiro Wilk Test Statistic					0.60	Shapiro Wilk GOF Test					
3235	5% Shapiro Wilk Critical Value					0.80	Detected Data Not Normal at 5% Significance Level					
3236	Lilliefors Test Statistic					0.43	Lilliefors GOF Test					
3237	5% Lilliefors Critical Value					0.33	Detected Data Not Normal at 5% Significance Level					
3238	Detected Data Not Normal at 5% Significance Level											
3239												
3240	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3241	Mean					0.06	Standard Error of Mean					0.02
3242	SD					0.17	95% KM (BCA) UCL					0.11
3243	95% KM (t) UCL					0.10	95% KM (Percentile Bootstrap) UCL					0.10
3244	95% KM (z) UCL					0.10	95% KM Bootstrap t UCL					0.19
3245	90% KM Chebyshev UCL					0.13	95% KM Chebyshev UCL					0.17
3246	97.5% KM Chebyshev UCL					0.21	99% KM Chebyshev UCL					0.31
3247												
3248	Gamma GOF Tests on Detected Observations Only											
3249	A-D Test Statistic					0.54	Anderson-Darling GOF Test					
3250	5% A-D Critical Value					0.73	data appear Gamma Distributed at 5% Significance Level					
3251	K-S Test Statistic					0.31	Kolmogrov-Smirnoff GOF					
3252	5% K-S Critical Value					0.32	data appear Gamma Distributed at 5% Significance Level					
3253	Detected data appear Gamma Distributed at 5% Significance Level											
3254												
3255	Gamma Statistics on Detected Data Only											
3256	k hat (MLE)					0.76	k star (bias corrected MLE)					0.53
3257	Theta hat (MLE)					0.38	Theta star (bias corrected MLE)					0.54
3258	nu hat (MLE)					10.7	nu star (bias corrected)					7.45
3259	MLE Mean (bias corrected)					0.29	MLE Sd (bias corrected)					0.39
3260												
3261	Gamma Kaplan-Meier (KM) Statistics											
3262	k hat (KM)					0.12	nu hat (KM)					14.6
3263	Approximate Chi Square Value (14.66, α)					7.02	Adjusted Chi Square Value (14.66, β)					6.89
3264	Approximate KM-UCL (use when n>=50)					0.12	Gamma Adjusted KM-UCL (use when n<50)					0.13
3265												
3266	Gamma ROS Statistics using Imputed Non-Detects											
3267	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3268	GROS may not be used when kstar of detected data is small such as < 0.1											
3269	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3270	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
3271	Minimum					0.01	Mean					0.04
3272	Maximum					1.3	Median					0.01
3273	SD					0.17	CV					3.91
3274	k hat (MLE)					0.53	k star (bias corrected MLE)					0.51
3275	Theta hat (MLE)					0.08	Theta star (bias corrected MLE)					0.08
3276	nu hat (MLE)					60.9	nu star (bias corrected)					59.0
3277	MLE Mean (bias corrected)					0.04	MLE Sd (bias corrected)					0.06
3278	Adjusted Level of Significance (β)											
3279	Approximate Chi Square Value (59.09, α)					42.4	Adjusted Chi Square Value (59.09, β)					42.0
3280	Gamma Approximate UCL (use when n>=50)					0.06	Gamma Adjusted UCL (use when n<50)					0.06

A	B	C	D	E	F	G	H	I	J	K	L
3281											
3282	Lognormal GOF Test on Detected Observations Only										
3283	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test					
3284	5% Shapiro Wilk Critical Value				0.80	Detected Data appear Lognormal at 5% Significance Level					
3285	Lilliefors Test Statistic				0.22	Lilliefors GOF Test					
3286	5% Lilliefors Critical Value				0.33	Detected Data appear Lognormal at 5% Significance Level					
3287	Detected Data appear Lognormal at 5% Significance Level										
3288											
3289	Lognormal ROS Statistics Using Imputed Non-Detects										
3290	Mean in Original Scale				0.05	Mean in Log Scale				-3.47	
3291	SD in Original Scale				0.17	SD in Log Scale				0.72	
3292	95% t UCL (assumes normality of ROS data)				0.09	95% Percentile Bootstrap UCL				0.10	
3293	95% BCA Bootstrap UCL				0.12	95% Bootstrap t UCL				0.23	
3294	95% H-UCL (Log ROS)				0.04						
3295											
3296	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
3297	KM Mean (logged)				-3.38	95% H-UCL (KM -Log)				0.05	
3298	KM SD (logged)				0.70	95% Critical H Value (KM-Log)				2.04	
3299	KM Standard Error of Mean (logged)				0.15						
3300											
3301	DL/2 Statistics										
3302	DL/2 Normal					DL/2 Log-Transformed					
3303	Mean in Original Scale				0.08	Mean in Log Scale				-3.29	
3304	SD in Original Scale				0.20	SD in Log Scale				0.94	
3305	95% t UCL (Assumes normality)				0.12	95% H-Stat UCL				0.07	
3306	DL/2 is not a recommended method, provided for comparisons and historical reasons										
3307											
3308	Nonparametric Distribution Free UCL Statistics										
3309	Detected Data appear Gamma Distributed at 5% Significance Level										
3310											
3311	Suggested UCL to Use										
3312	95% KM (t) UCL				0.10	95% GROS Approximate Gamma UCL				0.06	
3313	95% Approximate Gamma KM-UCL				0.12						
3314											
3315	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
3316	Recommendations are based upon data size, data distribution, and skewness.										
3317	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
3318	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult										
3319											
3320	Naphthalene										
3321											
3322	General Statistics										
3323	Total Number of Observations				57	Number of Distinct Observations				54	
3324	Number of Detects				7	Number of Non-Detects				50	
3325	Number of Distinct Detects				7	Number of Distinct Non-Detects				47	
3326	Minimum Detect				0.06	Minimum Non-Detect				0.03	
3327	Maximum Detect				2.67	Maximum Non-Detect				1.81	
3328	Variance Detects				0.87	Percent Non-Detects				87.7	
3329	Mean Detects				0.57	SD Detects				0.93	
3330	Median Detects				0.26	CV Detects				1.63	
3331	Skewness Detects				2.53	Kurtosis Detects				6.56	
3332	Mean of Logged Detects				-1.33	SD of Logged Detects				1.23	
3333											
3334	Normal GOF Test on Detects Only										
3335	Shapiro Wilk Test Statistic				0.58	Shapiro Wilk GOF Test					
3336	5% Shapiro Wilk Critical Value				0.80	Detected Data Not Normal at 5% Significance Level					
3337	Lilliefors Test Statistic				0.42	Lilliefors GOF Test					
3338	5% Lilliefors Critical Value				0.33	Detected Data Not Normal at 5% Significance Level					
3339	Detected Data Not Normal at 5% Significance Level										
3340											
3341	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
3342	Mean				0.10	Standard Error of Mean				0.05	
3343	SD				0.35	95% KM (BCA) UCL				0.19	
3344	95% KM (t) UCL				0.18	95% KM (Percentile Bootstrap) UCL				0.19	
3345	95% KM (z) UCL				0.18	95% KM Bootstrap t UCL				0.43	
3346	90% KM Chebyshev UCL				0.25	95% KM Chebyshev UCL				0.32	
3347	97.5% KM Chebyshev UCL				0.41	99% KM Chebyshev UCL				0.60	
3348											
3349	Gamma GOF Tests on Detected Observations Only										
3350	A-D Test Statistic				0.65	Anderson-Darling GOF Test					
3351	5% A-D Critical Value				0.73	Detected data appear Gamma Distributed at 5% Significance Level					
3352	K-S Test Statistic				0.31	Kolmogrov-Smirnoff GOF					
3353	5% K-S Critical Value				0.32	Detected data appear Gamma Distributed at 5% Significance Level					
3354	Detected data appear Gamma Distributed at 5% Significance Level										
3355											
3356	Gamma Statistics on Detected Data Only										
3357	k hat (MLE)				0.77	k star (bias corrected MLE)				0.53	
3358	Theta hat (MLE)				0.74	Theta star (bias corrected MLE)				1.06	
3359	nu hat (MLE)				10.79	nu star (bias corrected)				7.5	
3360	MLE Mean (bias corrected)				0.57	MLE Sd (bias corrected)				0.78	
3361											
3362	Gamma Kaplan-Meier (KM) Statistics										

	A	B	C	D	E	F	G	H	I	J	K	L
3363	k hat (KM)					0.084	nu hat (KM)					9.88
3364	Approximate Chi Square Value (9.88, α)					3.86	Adjusted Chi Square Value (9.88, β)					3.77
3365	Approximate KM-UCL (use when $n \geq 50$)					0.26	Gamma Adjusted KM-UCL (use when $n < 50$)					0.27
3366	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3367												
3368	Gamma ROS Statistics using Imputed Non-Detects											
3369	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
3370	GROS may not be used when kstar of detected data is small such as < 0.1											
3371	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3372	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3373	Minimum					0.01	Mean					0.074
3374	Maximum					2.67	Median					0.01
3375	SD					0.35	CV					4.52
3376	k hat (MLE)					0.39	k star (bias corrected MLE)					0.38
3377	Theta hat (MLE)					0.2	Theta star (bias corrected MLE)					0.20
3378	nu hat (MLE)					45.1	nu star (bias corrected)					44.0
3379	MLE Mean (bias corrected)					0.074	MLE Sd (bias corrected)					0.12
3380							Adjusted Level of Significance (β)					0.04
3381	Approximate Chi Square Value (44.07, α)					29.84	Adjusted Chi Square Value (44.07, β)					29.5
3382	Gamma Approximate UCL (use when $n \geq 50$)					0.11	Gamma Adjusted UCL (use when $n < 50$)					0.11
3383												
3384	Lognormal GOF Test on Detected Observations Only											
3385	Shapiro Wilk Test Statistic					0.92	Shapiro Wilk GOF Test					
3386	5% Shapiro Wilk Critical Value					0.80	Detected Data appear Lognormal at 5% Significance Level					
3387	Lilliefors Test Statistic					0.21	Lilliefors GOF Test					
3388	5% Lilliefors Critical Value					0.33	Detected Data appear Lognormal at 5% Significance Level					
3389	Detected Data appear Lognormal at 5% Significance Level											
3390												
3391	Lognormal ROS Statistics Using Imputed Non-Detects											
3392	Mean in Original Scale					0.07	Mean in Log Scale					-5.81
3393	SD in Original Scale					0.35	SD in Log Scale					1.77
3394	95% t UCL (assumes normality of ROS data)					0.15	95% Percentile Bootstrap UCL					0.16
3395	95% BCA Bootstrap UCL					0.22	95% Bootstrap t UCL					0.43
3396	95% H-UCL (Log ROS)					0.03						
3397												
3398	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
3399	KM Mean (logged)					-3.05	95% H-UCL (KM -Log)					0.074
3400	KM SD (logged)					0.77	95% Critical H Value (KM-Log)					2.1
3401	KM Standard Error of Mean (logged)					0.11						
3402												
3403	DL/2 Statistics											
3404	DL/2 Normal						DL/2 Log-Transformed					
3405	Mean in Original Scale					0.11	Mean in Log Scale					-3.21
3406	SD in Original Scale					0.37	SD in Log Scale					1.06
3407	95% t UCL (Assumes normality)					0.19	95% H-Stat UCL					0.1
3408	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3409												
3410	Nonparametric Distribution Free UCL Statistics											
3411	Detected Data appear Gamma Distributed at 5% Significance Level											
3412												
3413	Suggested UCL to Use											
3414	95% KM (t) UCL					0.18	95% GROS Approximate Gamma UCL					0.11
3415	95% Approximate Gamma KM-UCL					0.26						
3416												
3417	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3418	Recommendations are based upon data size, data distribution, and skewness.											
3419	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3420	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
3421												
3422	Nickel											
3423												
3424	General Statistics											
3425	Total Number of Observations					57	Number of Distinct Observations					54
3426	Number of Detects					56	Number of Non-Detects					1
3427	Number of Distinct Detects					53	Number of Distinct Non-Detects					1
3428	Minimum Detect					3.16	Minimum Non-Detect					0.43
3429	Maximum Detect					53	Maximum Non-Detect					0.43
3430	Variance Detects					42.5	Percent Non-Detects					1.75
3431	Mean Detects					6.43	SD Detects					6.51
3432	Median Detects					5.66	CV Detects					1.01
3433	Skewness Detects					6.86	Kurtosis Detects					49.6
3434	Mean of Logged Detects					1.72	SD of Logged Detects					0.4
3435												
3436	Normal GOF Test on Detects Only											
3437	Shapiro Wilk Test Statistic					0.31	Normal GOF Test on Detected Observations Only					
3438	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
3439	Lilliefors Test Statistic					0.37	Lilliefors GOF Test					
3440	5% Lilliefors Critical Value					0.11	Detected Data Not Normal at 5% Significance Level					
3441	Detected Data Not Normal at 5% Significance Level											
3442												
3443	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3444	Mean					6.32	Standard Error of Mean					0.86

	A	B	C	D	E	F	G	H	I	J	K	L	
3445					SD	6.45				95% KM (BCA) UCL		8.23	
3446					95% KM (t) UCL	7.76				95% KM (Percentile Bootstrap) UCL		8.03	
3447					95% KM (z) UCL	7.74				95% KM Bootstrap t UCL		11.04	
3448					90% KM Chebyshev UCL	8.91				95% KM Chebyshev UCL		10.04	
3449					97.5% KM Chebyshev UCL	11.7				99% KM Chebyshev UCL		14.9	
3450													
3451					Gamma GOF Tests on Detected Observations Only								
3452					A-D Test Statistic	5.60				Anderson-Darling GOF Test			
3453					5% A-D Critical Value	0.75				ected Data Not Gamma Distributed at 5% Significance Level			
3454					K-S Test Statistic	0.27				Kolmogrov-Smirnoff GOF			
3455					5% K-S Critical Value	0.11				ected Data Not Gamma Distributed at 5% Significance Level			
3456					Detected Data Not Gamma Distributed at 5% Significance Level								
3457													
3458					Gamma Statistics on Detected Data Only								
3459					k hat (MLE)	3.87				k star (bias corrected MLE)		3.67	
3460					Theta hat (MLE)	1.66				Theta star (bias corrected MLE)		1.75	
3461					nu hat (MLE)	433.6				nu star (bias corrected)		411.7	
3462					MLE Mean (bias corrected)	6.43				MLE Sd (bias corrected)		3.35	
3463													
3464					Gamma Kaplan-Meier (KM) Statistics								
3465					k hat (KM)	0.96				nu hat (KM)		109.6	
3466					pproximate Chi Square Value (109.57, α)	86.4				Adjusted Chi Square Value (109.57, β)		85.8	
3467					Approximate KM-UCL (use when $n \geq 50$)	8.02				Gamma Adjusted KM-UCL (use when $n < 50$)		8.07	
3468													
3469					Gamma ROS Statistics using Imputed Non-Detects								
3470					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs								
3471					GROS may not be used when kstar of detected data is small such as < 0.1								
3472					For such situations, GROS method tends to yield inflated values of UCLs and BTVs								
3473					Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e								
3474					Minimum	0.01				Mean		6.31	
3475					Maximum	53				Median		5.57	
3476					SD	6.51				CV		1.03	
3477					k hat (MLE)	2.34				k star (bias corrected MLE)		2.23	
3478					Theta hat (MLE)	2.69				Theta star (bias corrected MLE)		2.82	
3479					nu hat (MLE)	267.4				nu star (bias corrected)		254.6	
3480					MLE Mean (bias corrected)	6.31				MLE Sd (bias corrected)		4.22	
3481										Adjusted Level of Significance (β)		0.04	
3482					pproximate Chi Square Value (254.62, α)	218.7				Adjusted Chi Square Value (254.62, β)		217.8	
3483					Gamma Approximate UCL (use when $n \geq 50$)	7.35				Gamma Adjusted UCL (use when $n < 50$)		7.38	
3484													
3485					Lognormal GOF Test on Detected Observations Only								
3486					Lilliefors Test Statistic	0.20				Lilliefors GOF Test			
3487					5% Lilliefors Critical Value	0.11				ected Data Not Lognormal at 5% Significance Level			
3488					Detected Data Not Lognormal at 5% Significance Level								
3489													
3490					Lognormal ROS Statistics Using Imputed Non-Detects								
3491					Mean in Original Scale	6.35				Mean in Log Scale		1.71	
3492					SD in Original Scale	6.48				SD in Log Scale		0.41	
3493					95% t UCL (assumes normality of ROS data)	7.79				95% Percentile Bootstrap UCL		7.99	
3494					95% BCA Bootstrap UCL	8.95				95% Bootstrap t UCL		11.3	
3495					95% H-UCL (Log ROS)	6.67							
3496													
3497					DL/2 Statistics								
3498					DL/2 Normal					DL/2 Log-Transformed			
3499					Mean in Original Scale	6.32				Mean in Log Scale		1.66	
3500					SD in Original Scale	6.51				SD in Log Scale		0.58	
3501					95% t UCL (Assumes normality)	7.76				95% H-Stat UCL		7.34	
3502					DL/2 is not a recommended method, provided for comparisons and historical reasons								
3503													
3504					Nonparametric Distribution Free UCL Statistics								
3505					Data do not follow a Discernible Distribution at 5% Significance Level								
3506													
3507					Suggested UCL to Use								
3508					95% KM (Chebyshev) UCL	10.04							
3509													
3510					Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate								
3511					Recommendations are based upon data size, data distribution, and skewness.								
3512					Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and								
3513					Recommendations results will not cover all Real World data sets; for additional insight the user may want to cons								
3514													
3515					Phenanthrene								
3516													
3517					General Statistics								
3518					Total Number of Observations	57				Number of Distinct Observations		55	
3519					Number of Detects	34				Number of Non-Detects		23	
3520					Number of Distinct Detects	34				Number of Distinct Non-Detects		23	
3521					Minimum Detect	0.01				Minimum Non-Detect		0.03	
3522					Maximum Detect	85.7				Maximum Non-Detect		0.40	
3523					Variance Detects	216.8				Percent Non-Detects		40.3	
3524					Mean Detects	3.80				SD Detects		14.7	
3525					Median Detects	0.13				CV Detects		3.87	
3526					Skewness Detects	5.53				Kurtosis Detects		31.4	

	A	B	C	D	E	F	G	H	I	J	K	L
3527	Mean of Logged Detects					-1.40	SD of Logged Detects					2.21
3528												
3529	Normal GOF Test on Detects Only											
3530	Shapiro Wilk Test Statistic					0.27	Shapiro Wilk GOF Test					
3531	5% Shapiro Wilk Critical Value					0.93	Detected Data Not Normal at 5% Significance Level					
3532	Lilliefors Test Statistic					0.39	Lilliefors GOF Test					
3533	5% Lilliefors Critical Value					0.15	Detected Data Not Normal at 5% Significance Level					
3534	Detected Data Not Normal at 5% Significance Level											
3535												
3536	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3537	Mean					2.28	Standard Error of Mean					1.52
3538	SD					11.34	95% KM (BCA) UCL					5.26
3539	95% KM (t) UCL					4.83	95% KM (Percentile Bootstrap) UCL					5.12
3540	95% KM (z) UCL					4.79	95% KM Bootstrap t UCL					16.94
3541	90% KM Chebyshev UCL					6.86	95% KM Chebyshev UCL					8.93
3542	97.5% KM Chebyshev UCL					11.81	99% KM Chebyshev UCL					17.41
3543												
3544	Gamma GOF Tests on Detected Observations Only											
3545	A-D Test Statistic					3.31	Anderson-Darling GOF Test					
3546	5% A-D Critical Value					0.87	Detected Data Not Gamma Distributed at 5% Significance Level					
3547	K-S Test Statistic					0.23	Kolmogrov-Smirnoff GOF					
3548	5% K-S Critical Value					0.16	Detected Data Not Gamma Distributed at 5% Significance Level					
3549	Detected Data Not Gamma Distributed at 5% Significance Level											
3550												
3551	Gamma Statistics on Detected Data Only											
3552	k hat (MLE)					0.25	k star (bias corrected MLE)					0.25
3553	Theta hat (MLE)					14.75	Theta star (bias corrected MLE)					14.91
3554	nu hat (MLE)					17.54	nu star (bias corrected)					17.33
3555	MLE Mean (bias corrected)					3.80	MLE Sd (bias corrected)					7.53
3556												
3557	Gamma Kaplan-Meier (KM) Statistics											
3558	k hat (KM)					0.04	nu hat (KM)					4.59
3559	Approximate Chi Square Value (4.60, α)					0.97	Adjusted Chi Square Value (4.60, β)					0.93
3560	Approximate KM-UCL (use when $n \geq 50$)					10.81	Gamma Adjusted KM-UCL (use when $n < 50$)					11.21
3561	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3562												
3563	Gamma ROS Statistics using Imputed Non-Detects											
3564	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
3565	GROS may not be used when kstar of detected data is small such as < 0.1											
3566	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3567	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3568	Minimum					0.01	Mean					2.27
3569	Maximum					85.7	Median					0.02
3570	SD					11.44	CV					5.04
3571	k hat (MLE)					0.20	k star (bias corrected MLE)					0.20
3572	Theta hat (MLE)					10.93	Theta star (bias corrected MLE)					10.81
3573	nu hat (MLE)					23.71	nu star (bias corrected)					23.81
3574	MLE Mean (bias corrected)					2.27	MLE Sd (bias corrected)					4.97
3575							Adjusted Level of Significance (β)					0.04
3576	Approximate Chi Square Value (23.80, α)					13.69	Adjusted Chi Square Value (23.80, β)					13.41
3577	Gamma Approximate UCL (use when $n \geq 50$)					3.95	Gamma Adjusted UCL (use when $n < 50$)					4.00
3578												
3579	Lognormal GOF Test on Detected Observations Only											
3580	Shapiro Wilk Test Statistic					0.92	Shapiro Wilk GOF Test					
3581	5% Shapiro Wilk Critical Value					0.93	Detected Data Not Lognormal at 5% Significance Level					
3582	Lilliefors Test Statistic					0.14	Lilliefors GOF Test					
3583	5% Lilliefors Critical Value					0.15	Detected Data appear Lognormal at 5% Significance Level					
3584	Detected Data appear Approximate Lognormal at 5% Significance Level											
3585												
3586	Lognormal ROS Statistics Using Imputed Non-Detects											
3587	Mean in Original Scale					2.27	Mean in Log Scale					-2.36
3588	SD in Original Scale					11.44	SD in Log Scale					2.07
3589	95% t UCL (assumes normality of ROS data)					4.81	95% Percentile Bootstrap UCL					5.15
3590	95% BCA Bootstrap UCL					7.01	95% Bootstrap t UCL					17.51
3591	95% H-UCL (Log ROS)					2.37						
3592												
3593	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
3594	KM Mean (logged)					-2.30	95% H-UCL (KM -Log)					2.19
3595	KM SD (logged)					2.03	95% Critical H Value (KM-Log)					3.81
3596	KM Standard Error of Mean (logged)					0.27						
3597												
3598	DL/2 Statistics											
3599	DL/2 Normal						DL/2 Log-Transformed					
3600	Mean in Original Scale					2.28	Mean in Log Scale					-2.25
3601	SD in Original Scale					11.44	SD in Log Scale					2.03
3602	95% t UCL (Assumes normality)					4.82	95% H-Stat UCL					2.33
3603	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3604												
3605	Nonparametric Distribution Free UCL Statistics											
3606	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
3607												
3608	Suggested UCL to Use											

	A	B	C	D	E	F	G	H	I	J	K	L
3609	99% KM (Chebyshev) UCL					17.4						
3610												
3611	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3612	Recommendations are based upon data size, data distribution, and skewness.											
3613	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3614	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
3615												
3616	Plutonium-239/240											
3617												
3618	General Statistics											
3619	Total Number of Observations				57	Number of Distinct Observations				56		
3620	Number of Detects				39	Number of Non-Detects				18		
3621	Number of Distinct Detects				38	Number of Distinct Non-Detects				18		
3622	Minimum Detect				0.01	Minimum Non-Detect				-0.004		
3623	Maximum Detect				0.09	Maximum Non-Detect				0.02		
3624	Variance Detects				3.7169	Percent Non-Detects				31.5		
3625	Mean Detects				0.04	SD Detects				0.01		
3626	Median Detects				0.03	CV Detects				0.43		
3627	Skewness Detects				1.32	Kurtosis Detects				1.11		
3628												
3629	Normal GOF Test on Detects Only											
3630	Shapiro Wilk Test Statistic				0.85	Shapiro Wilk GOF Test						
3631	5% Shapiro Wilk Critical Value				0.93	Detected Data Not Normal at 5% Significance Level						
3632	Lilliefors Test Statistic				0.16	Lilliefors GOF Test						
3633	5% Lilliefors Critical Value				0.14	Detected Data Not Normal at 5% Significance Level						
3634	Detected Data Not Normal at 5% Significance Level											
3635												
3636	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3637	Mean				0.02	Standard Error of Mean				0.003		
3638	SD				0.02	95% KM (BCA) UCL				0.03		
3639	95% KM (t) UCL				0.03	95% KM (Percentile Bootstrap) UCL				0.03		
3640	95% KM (z) UCL				0.03	95% KM Bootstrap t UCL				0.03		
3641	90% KM Chebyshev UCL				0.03	95% KM Chebyshev UCL				0.04		
3642	97.5% KM Chebyshev UCL				0.05	99% KM Chebyshev UCL				0.06		
3643												
3644	Gamma GOF Tests on Detected Observations Only											
3645	A-D Test Statistic				0.95	Anderson-Darling GOF Test						
3646	5% A-D Critical Value				0.75	ed Data Not Gamma Distributed at 5% Significanc						
3647	K-S Test Statistic				0.12	Kolmogrov-Smirnoff GOF						
3648	5% K-S Critical Value				0.14	data appear Gamma Distributed at 5% Significar						
3649	Detected data follow Appr. Gamma Distribution at 5% Significance Level											
3650												
3651	Gamma Statistics on Detected Data Only											
3652	k hat (MLE)				6.38	k star (bias corrected MLE)				5.91		
3653	Theta hat (MLE)				0.006	Theta star (bias corrected MLE)				0.007		
3654	nu hat (MLE)				498.1	nu star (bias corrected)				461.1		
3655	MLE Mean (bias corrected)				0.04	MLE Sd (bias corrected)				0.01		
3656												
3657	Gamma Kaplan-Meier (KM) Statistics											
3658	k hat (KM)				1.10	nu hat (KM)				125.6		
3659						Adjusted Level of Significance (β)				0.04		
3660	pproximate Chi Square Value (125.63, α)				100.7	Adjusted Chi Square Value (125.63, β)				100.2		
3661	Approximate KM-UCL (use when $n \geq 50$)				0.03	mma Adjusted KM-UCL (use when $n < 50$)				0.03		
3662												
3663	DL/2 Statistics											
3664	Mean in Original Scale				0.03	SD in Original Scale				0.02		
3665	95% t UCL (Assumes normality)				0.03							
3666	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3667												
3668	Nonparametric Distribution Free UCL Statistics											
3669	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
3670												
3671	Suggested UCL to Use											
3672	95% KM (Percentile Bootstrap) UCL				0.03	95% GROS Approximate Gamma UCL				N/A		
3673	95% Approximate Gamma KM-UCL				0.03							
3674	Warning: One or more Recommended UCL(s) not available!											
3675												
3676	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3677	Recommendations are based upon data size, data distribution, and skewness.											
3678	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3679	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
3680												
3681	Pyrene											
3682												
3683	General Statistics											
3684	Total Number of Observations				57	Number of Distinct Observations				55		
3685	Number of Detects				39	Number of Non-Detects				18		
3686	Number of Distinct Detects				39	Number of Distinct Non-Detects				18		
3687	Minimum Detect				0.01	Minimum Non-Detect				0.03		
3688	Maximum Detect				75.6	Maximum Non-Detect				0.40		
3689	Variance Detects				154.3	Percent Non-Detects				31.5		
3690	Mean Detects				3.60	SD Detects				12.4		

	A	B	C	D	E	F	G	H	I	J	K	L
3773	Recommendations are based upon data size, data distribution, and skewness.											
3774	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3775	Simulations results will not cover all Real World data sets; for additional insight the user may want to cons											
3776												
3777	Silver											
3778												
3779	General Statistics											
3780	Total Number of Observations				57	Number of Distinct Observations				53		
3781	Number of Detects				31	Number of Non-Detects				26		
3782	Number of Distinct Detects				30	Number of Distinct Non-Detects				23		
3783	Minimum Detect				0.12	Minimum Non-Detect				0.55		
3784	Maximum Detect				348	Maximum Non-Detect				0.96		
3785	Variance Detects				5408	Percent Non-Detects				45.6		
3786	Mean Detects				23.14	SD Detects				73.5		
3787	Median Detects				0.31	CV Detects				3.17		
3788	Skewness Detects				3.72	Kurtosis Detects				14.13		
3789	Mean of Logged Detects				-0.29	SD of Logged Detects				2.23		
3790												
3791	Normal GOF Test on Detects Only											
3792	Shapiro Wilk Test Statistic				0.36	Shapiro Wilk GOF Test						
3793	5% Shapiro Wilk Critical Value				0.92	Detected Data Not Normal at 5% Significance Level						
3794	Lilliefors Test Statistic				0.46	Lilliefors GOF Test						
3795	5% Lilliefors Critical Value				0.15	Detected Data Not Normal at 5% Significance Level						
3796	Detected Data Not Normal at 5% Significance Level											
3797												
3798	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3799	Mean				12.64	Standard Error of Mean				7.34		
3800	SD				54.56	95% KM (BCA) UCL				28.2		
3801	95% KM (t) UCL				24.94	95% KM (Percentile Bootstrap) UCL				26.4		
3802	95% KM (z) UCL				24.74	95% KM Bootstrap t UCL				55.5		
3803	90% KM Chebyshev UCL				34.74	95% KM Chebyshev UCL				44.7		
3804	97.5% KM Chebyshev UCL				58.5	99% KM Chebyshev UCL				85.7		
3805												
3806	Gamma GOF Tests on Detected Observations Only											
3807	A-D Test Statistic				6.15	Anderson-Darling GOF Test						
3808	5% A-D Critical Value				0.89	Detected Data Not Gamma Distributed at 5% Significance Level						
3809	K-S Test Statistic				0.36	Kolmogorov-Smirnoff GOF						
3810	5% K-S Critical Value				0.17	Detected Data Not Gamma Distributed at 5% Significance Level						
3811	Detected Data Not Gamma Distributed at 5% Significance Level											
3812												
3813	Gamma Statistics on Detected Data Only											
3814	k hat (MLE)				0.21	k star (bias corrected MLE)				0.21		
3815	Theta hat (MLE)				108.9	Theta star (bias corrected MLE)				108.4		
3816	nu hat (MLE)				13.1	nu star (bias corrected)				13.2		
3817	MLE Mean (bias corrected)				23.14	MLE Sd (bias corrected)				50.0		
3818												
3819	Gamma Kaplan-Meier (KM) Statistics											
3820	k hat (KM)				0.054	nu hat (KM)				6.17		
3821	Approximate Chi Square Value (6.17, α)				1.72	Adjusted Chi Square Value (6.17, β)				1.66		
3822	Approximate KM-UCL (use when $n \geq 50$)				45.3	Gamma Adjusted KM-UCL (use when $n < 50$)				46.9		
3823	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3824												
3825	Gamma ROS Statistics using Imputed Non-Detects											
3826	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
3827	GROS may not be used when kstar of detected data is small such as < 0.1											
3828	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3829	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
3830	Minimum				0.01	Mean				12.5		
3831	Maximum				348	Median				0.16		
3832	SD				55.0	CV				4.37		
3833	k hat (MLE)				0.15	k star (bias corrected MLE)				0.16		
3834	Theta hat (MLE)				79.14	Theta star (bias corrected MLE)				77.5		
3835	nu hat (MLE)				18.1	nu star (bias corrected)				18.5		
3836	MLE Mean (bias corrected)				12.54	MLE Sd (bias corrected)				31.2		
3837						Adjusted Level of Significance (β)				0.04		
3838	Approximate Chi Square Value (18.51, α)				9.76	Adjusted Chi Square Value (18.51, β)				9.59		
3839	Gamma Approximate UCL (use when $n \geq 50$)				23.85	Gamma Adjusted UCL (use when $n < 50$)				24.2		
3840												
3841	Lognormal GOF Test on Detected Observations Only											
3842	Shapiro Wilk Test Statistic				0.71	Shapiro Wilk GOF Test						
3843	5% Shapiro Wilk Critical Value				0.92	Detected Data Not Lognormal at 5% Significance Level						
3844	Lilliefors Test Statistic				0.26	Lilliefors GOF Test						
3845	5% Lilliefors Critical Value				0.15	Detected Data Not Lognormal at 5% Significance Level						
3846	Detected Data Not Lognormal at 5% Significance Level											
3847												
3848	Lognormal ROS Statistics Using Imputed Non-Detects											
3849	Mean in Original Scale				12.74	Mean in Log Scale				-0.68		
3850	SD in Original Scale				55.0	SD in Log Scale				1.70		
3851	95% t UCL (assumes normality of ROS data)				24.94	95% Percentile Bootstrap UCL				25.8		
3852	95% BCA Bootstrap UCL				31.4	95% Bootstrap t UCL				56.1		
3853	95% H-UCL (Log ROS)				4.65							
3854												

	A	B	C	D	E	F	G	H	I	J	K	L
3855	DL/2 Statistics											
3856	DL/2 Normal						DL/2 Log-Transformed					
3857	Mean in Original Scale					12.7	Mean in Log Scale					-0.67
3858	SD in Original Scale					55.0	SD in Log Scale					1.69
3859	95% t UCL (Assumes normality)					24.9	95% H-Stat UCL					4.54
3860	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3861												
3862	Nonparametric Distribution Free UCL Statistics											
3863	Data do not follow a Discernible Distribution at 5% Significance Level											
3864												
3865	Suggested UCL to Use											
3866	99% KM (Chebyshev) UCL					85.7						
3867												
3868	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3869	Recommendations are based upon data size, data distribution, and skewness.											
3870	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3871	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
3872												
3873	Sodium											
3874												
3875	General Statistics											
3876	Total Number of Observations					57	Number of Distinct Observations					56
3877	Number of Detects					27	Number of Non-Detects					30
3878	Number of Distinct Detects					27	Number of Distinct Non-Detects					29
3879	Minimum Detect					42.7	Minimum Non-Detect					43.6
3880	Maximum Detect					1000	Maximum Non-Detect					101
3881	Variance Detects					44633	Percent Non-Detects					52.6
3882	Mean Detects					208.8	SD Detects					211.3
3883	Median Detects					109	CV Detects					1.01
3884	Skewness Detects					2.43	Kurtosis Detects					6.89
3885	Mean of Logged Detects					5.00	SD of Logged Detects					0.77
3886												
3887	Normal GOF Test on Detects Only											
3888	Shapiro Wilk Test Statistic					0.70	Shapiro Wilk GOF Test					
3889	5% Shapiro Wilk Critical Value					0.92	Detected Data Not Normal at 5% Significance Level					
3890	Lilliefors Test Statistic					0.24	Lilliefors GOF Test					
3891	5% Lilliefors Critical Value					0.17	Detected Data Not Normal at 5% Significance Level					
3892	Detected Data Not Normal at 5% Significance Level											
3893												
3894	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3895	Mean					124.4	Standard Error of Mean					22.1
3896	SD					163.9	95% KM (BCA) UCL					164.5
3897	95% KM (t) UCL					161.4	95% KM (Percentile Bootstrap) UCL					162.5
3898	95% KM (z) UCL					160.8	95% KM Bootstrap t UCL					182.4
3899	90% KM Chebyshev UCL					190.9	95% KM Chebyshev UCL					221
3900	97.5% KM Chebyshev UCL					262.8	99% KM Chebyshev UCL					345
3901												
3902	Gamma GOF Tests on Detected Observations Only											
3903	A-D Test Statistic					1.38	Anderson-Darling GOF Test					
3904	5% A-D Critical Value					0.76	Detected Data Not Gamma Distributed at 5% Significance Level					
3905	K-S Test Statistic					0.22	Kolmogorov-Smirnov GOF					
3906	5% K-S Critical Value					0.17	Detected Data Not Gamma Distributed at 5% Significance Level					
3907	Detected Data Not Gamma Distributed at 5% Significance Level											
3908												
3909	Gamma Statistics on Detected Data Only											
3910	k hat (MLE)					1.64	k star (bias corrected MLE)					1.48
3911	Theta hat (MLE)					126.8	Theta star (bias corrected MLE)					140.3
3912	nu hat (MLE)					88.9	nu star (bias corrected)					80.3
3913	MLE Mean (bias corrected)					208.8	MLE Sd (bias corrected)					171.2
3914												
3915	Gamma Kaplan-Meier (KM) Statistics											
3916	k hat (KM)					0.57	nu hat (KM)					65.6
3917	Approximate Chi Square Value (65.63, α)					47.9	Adjusted Chi Square Value (65.63, β)					47.6
3918	Approximate KM-UCL (use when $n \geq 50$)					170.1	Gamma Adjusted KM-UCL (use when $n < 50$)					171.5
3919												
3920	Gamma ROS Statistics using Imputed Non-Detects											
3921	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3922	GROS may not be used when kstar of detected data is small such as < 0.1											
3923	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3924	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3925	Minimum					0.01	Mean					98.9
3926	Maximum					1000	Median					0.01
3927	SD					178.3	CV					1.80
3928	k hat (MLE)					0.16	k star (bias corrected MLE)					0.16
3929	Theta hat (MLE)					605.5	Theta star (bias corrected MLE)					594.2
3930	nu hat (MLE)					18.6	nu star (bias corrected)					18.9
3931	MLE Mean (bias corrected)					98.9	MLE Sd (bias corrected)					242.4
3932							Adjusted Level of Significance (β)					0.04
3933	Approximate Chi Square Value (18.98, α)					10.1	Adjusted Chi Square Value (18.98, β)					9.93
3934	Gamma Approximate UCL (use when $n \geq 50$)					185.8	Gamma Adjusted UCL (use when $n < 50$)					189
3935												
3936	Lognormal GOF Test on Detected Observations Only											

	A	B	C	D	E	F	G	H	I	J	K	L	
3937	Shapiro Wilk Test Statistic					0.92	Shapiro Wilk GOF Test						
3938	5% Shapiro Wilk Critical Value					0.92	Detected Data appear Lognormal at 5% Significance Level						
3939	Lilliefors Test Statistic					0.18	Lilliefors GOF Test						
3940	5% Lilliefors Critical Value					0.17	Detected Data Not Lognormal at 5% Significance Level						
3941	Detected Data appear Approximate Lognormal at 5% Significance Level												
3942													
3943	Lognormal ROS Statistics Using Imputed Non-Detects												
3944	Mean in Original Scale					115.3	Mean in Log Scale					4.17	
3945	SD in Original Scale					169.6	SD in Log Scale					0.97	
3946	95% t UCL (assumes normality of ROS data)					152.8	95% Percentile Bootstrap UCL					153.4	
3947	95% BCA Bootstrap UCL					165.2	95% Bootstrap t UCL					180	
3948	95% H-UCL (Log ROS)					139.8							
3949													
3950	PLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
3951	KM Mean (logged)					4.4	95% H-UCL (KM -Log)					139.9	
3952	KM SD (logged)					0.79	95% Critical H Value (KM-Log)					2.12	
3953	KM Standard Error of Mean (logged)					0.11							
3954													
3955	DL/2 Statistics												
3956	DL/2 Normal						DL/2 Log-Transformed						
3957	Mean in Original Scale					118.7	Mean in Log Scale					4.26	
3958	SD in Original Scale					167.9	SD in Log Scale					0.90	
3959	95% t UCL (Assumes normality)					155.9	95% H-Stat UCL					139.9	
3960	DL/2 is not a recommended method, provided for comparisons and historical reasons												
3961													
3962	Nonparametric Distribution Free UCL Statistics												
3963	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level												
3964													
3965	Suggested UCL to Use												
3966	95% KM (t) UCL					161.4	95% KM (% Bootstrap) UCL					162.5	
3967													
3968	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
3969	Recommendations are based upon data size, data distribution, and skewness.												
3970	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
3971	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												
3972													
3973	Toluene												
3974													
3975	General Statistics												
3976	Total Number of Observations					57	Number of Distinct Observations					43	
3977	Number of Detects					23	Number of Non-Detects					34	
3978	Number of Distinct Detects					21	Number of Distinct Non-Detects					22	
3979	Minimum Detect					3.3400E	Minimum Non-Detect					0.001	
3980	Maximum Detect					0.005	Maximum Non-Detect					0.001	
3981	Variance Detects					2.0979E	Percent Non-Detects					59.6	
3982	Mean Detects					0.001	SD Detects					0.001	
3983	Median Detects					0.001	CV Detects					0.92	
3984	Skewness Detects					1.86	Kurtosis Detects					2.77	
3985	Mean of Logged Detects					-6.77	SD of Logged Detects					0.76	
3986													
3987	Normal GOF Test on Detects Only												
3988	Shapiro Wilk Test Statistic					0.73	Shapiro Wilk GOF Test						
3989	5% Shapiro Wilk Critical Value					0.91	Detected Data Not Normal at 5% Significance Level						
3990	Lilliefors Test Statistic					0.27	Lilliefors GOF Test						
3991	5% Lilliefors Critical Value					0.18	Detected Data Not Normal at 5% Significance Level						
3992	Detected Data Not Normal at 5% Significance Level												
3993													
3994	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
3995	Mean					0.001	Standard Error of Mean					1.4372E	
3996	SD					9.9993E	95% KM (BCA) UCL					0.001	
3997	95% KM (t) UCL					0.001	95% KM (Percentile Bootstrap) UCL					0.001	
3998	95% KM (z) UCL					0.001	95% KM Bootstrap t UCL					0.001	
3999	90% KM Chebyshev UCL					0.001	95% KM Chebyshev UCL					0.001	
4000	97.5% KM Chebyshev UCL					0.001	99% KM Chebyshev UCL					0.002	
4001													
4002	Gamma GOF Tests on Detected Observations Only												
4003	A-D Test Statistic					0.96	Anderson-Darling GOF Test						
4004	5% A-D Critical Value					0.75	Detected Data Not Gamma Distributed at 5% Significance Level						
4005	K-S Test Statistic					0.21	Kolmogrov-Smirnoff GOF						
4006	5% K-S Critical Value					0.18	Detected Data Not Gamma Distributed at 5% Significance Level						
4007	Detected Data Not Gamma Distributed at 5% Significance Level												
4008													
4009	Gamma Statistics on Detected Data Only												
4010	k hat (MLE)					1.76	k star (bias corrected MLE)					1.56	
4011	Theta hat (MLE)					8.8556E	Theta star (bias corrected MLE)					9.9953E	
4012	nu hat (MLE)					81.2	nu star (bias corrected)					71.9	
4013	MLE Mean (bias corrected)					0.001	MLE Sd (bias corrected)					0.001	
4014													
4015	Gamma Kaplan-Meier (KM) Statistics												
4016	k hat (KM)					1.19	nu hat (KM)					136.3	
4017	Approximate Chi Square Value (136.26, α)					110.3	Adjusted Chi Square Value (136.26, β)					109.7	
4018	Approximate KM-UCL (use when n>=50)					0.001	Gamma Adjusted KM-UCL (use when n<50)					0.001	

	A	B	C	D	E	F	G	H	I	J	K	L														
4019																										
4020	Gamma ROS Statistics using Imputed Non-Detects																									
4021	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs																									
4022	GROS may not be used when kstar of detected data is small such as < 0.1																									
4023	For such situations, GROS method tends to yield inflated values of UCLs and BTVs																									
4024	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates																									
4025		Minimum	3.3400E		Mean	0.006																				
4026		Maximum	0.01		Median	0.01																				
4027		SD	0.004		CV	0.64																				
4028		k hat (MLE)	1.23		k star (bias corrected MLE)	1.18																				
4029		Theta hat (MLE)	0.005		Theta star (bias corrected MLE)	0.005																				
4030		nu hat (MLE)	140.6		nu star (bias corrected)	134.5																				
4031		MLE Mean (bias corrected)	0.006		MLE Sd (bias corrected)	0.006																				
4032					Adjusted Level of Significance (β)	0.04																				
4033		Approximate Chi Square Value (134.53, α)	108.7		Adjusted Chi Square Value (134.53, β)	108.1																				
4034		Gamma Approximate UCL (use when n>=50)	0.008		Gamma Adjusted UCL (use when n<50)	0.008																				
4035																										
4036	Lognormal GOF Test on Detected Observations Only																									
4037		Shapiro Wilk Test Statistic	0.94		Shapiro Wilk GOF Test																					
4038		5% Shapiro Wilk Critical Value	0.91		Detected Data appear Lognormal at 5% Significance Level																					
4039		Lilliefors Test Statistic	0.16		Lilliefors GOF Test																					
4040		5% Lilliefors Critical Value	0.18		Detected Data appear Lognormal at 5% Significance Level																					
4041	Detected Data appear Lognormal at 5% Significance Level																									
4042																										
4043	Lognormal ROS Statistics Using Imputed Non-Detects																									
4044		Mean in Original Scale	0.001		Mean in Log Scale	-7.01																				
4045		SD in Original Scale	9.9621E		SD in Log Scale	0.55																				
4046		95% t UCL (assumes normality of ROS data)	0.001		95% Percentile Bootstrap UCL	0.001																				
4047		95% BCA Bootstrap UCL	0.001		95% Bootstrap t UCL	0.001																				
4048		95% H-UCL (Log ROS)	0.001																							
4049																										
4050	KMs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed																									
4051		KM Mean (logged)	-7.04		95% H-UCL (KM -Log)	0.001																				
4052		KM SD (logged)	0.6		95% Critical H Value (KM-Log)	1.95																				
4053		KM Standard Error of Mean (logged)	0.10																							
4054																										
4055	DL/2 Statistics																									
4056		DL/2 Normal			DL/2 Log-Transformed																					
4057		Mean in Original Scale	0.001		Mean in Log Scale	-7.11																				
4058		SD in Original Scale	0.001		SD in Log Scale	0.56																				
4059		95% t UCL (Assumes normality)	0.001		95% H-Stat UCL	0.001																				
4060	DL/2 is not a recommended method, provided for comparisons and historical reasons																									
4061																										
4062	Nonparametric Distribution Free UCL Statistics																									
4063	Detected Data appear Lognormal Distributed at 5% Significance Level																									
4064																										
4065	Suggested UCL to Use																									
4066		95% KM (t) UCL	0.001		95% KM (% Bootstrap) UCL	0.001																				
4067																										
4068	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate																									
4069	Recommendations are based upon data size, data distribution, and skewness.																									
4070	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and																									
4071	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult																									
4072																										
4073	Trichloroethene																									
4074																										
4075	General Statistics																									
4076		Total Number of Observations	57		Number of Distinct Observations	41																				
4077		Number of Detects	5		Number of Non-Detects	52																				
4078		Number of Distinct Detects	5		Number of Distinct Non-Detects	36																				
4079		Minimum Detect	6.0500E		Minimum Non-Detect	0.001																				
4080		Maximum Detect	9.0500E		Maximum Non-Detect	0.002																				
4081		Variance Detects	1.4298E		Percent Non-Detects	91.2																				
4082		Mean Detects	7.0080E		SD Detects	1.1958E																				
4083		Median Detects	6.6100E		CV Detects	0.17																				
4084		Skewness Detects	1.76		Kurtosis Detects	3.29																				
4085		Mean of Logged Detects	-7.27		SD of Logged Detects	0.15																				
4086																										
4087	Normal GOF Test on Detects Only																									
4088		Shapiro Wilk Test Statistic	0.81		Shapiro Wilk GOF Test																					
4089		5% Shapiro Wilk Critical Value	0.76		Detected Data appear Normal at 5% Significance Level																					
4090		Lilliefors Test Statistic	0.29		Lilliefors GOF Test																					
4091		5% Lilliefors Critical Value	0.39		Detected Data appear Normal at 5% Significance Level																					
4092	Detected Data appear Normal at 5% Significance Level																									
4093																										
4094	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs																									
4095		Mean	7.0080E		Standard Error of Mean	5.3476E																				
4096		SD	1.0695E		95% KM (BCA) UCL	8.0300E																				
4097		95% KM (t) UCL	7.9024E		95% KM (Percentile Bootstrap) UCL	8.0160E																				
4098		95% KM (z) UCL	7.8876E		95% KM Bootstrap t UCL	0.001																				
4099		90% KM Chebyshev UCL	8.6123E		95% KM Chebyshev UCL	9.3389E																				
4100		97.5% KM Chebyshev UCL	0.001		99% KM Chebyshev UCL	0.001																				

	A	B	C	D	E	F	G	H	I	J	K	L	
4101													
4102	Gamma GOF Tests on Detected Observations Only												
4103	A-D Test Statistic				0.50	Anderson-Darling GOF Test							
4104	5% A-D Critical Value				0.67	data appear Gamma Distributed at 5% Significance Level							
4105	K-S Test Statistic				0.28	Kolmogrov-Smirnoff GOF							
4106	5% K-S Critical Value				0.35	data appear Gamma Distributed at 5% Significance Level							
4107	Detected data appear Gamma Distributed at 5% Significance Level												
4108													
4109	Gamma Statistics on Detected Data Only												
4110	k hat (MLE)				47.5	k star (bias corrected MLE)				19.14			
4111	Theta hat (MLE)				1.4749E	Theta star (bias corrected MLE)				3.6615E			
4112	nu hat (MLE)				475.2	nu star (bias corrected)				191.4			
4113	MLE Mean (bias corrected)				7.0080E	MLE Sd (bias corrected)				1.6019E			
4114													
4115	Gamma Kaplan-Meier (KM) Statistics												
4116	k hat (KM)				42.9	nu hat (KM)				4895			
4117	Approximate Chi Square Value (N/A, α)				4733	Adjusted Chi Square Value (N/A, β)				4729			
4118	Approximate KM-UCL (use when n>=50)				7.2473E	Gamma Adjusted KM-UCL (use when n<50)				7.2535E			
4119													
4120	Gamma ROS Statistics using Imputed Non-Detects												
4121	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
4122	GROS may not be used when kstar of detected data is small such as < 0.1												
4123	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
4124	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate												
4125	Minimum				6.0500E	Mean				0.009			
4126	Maximum				0.01	Median				0.01			
4127	SD				0.002	CV				0.28			
4128	k hat (MLE)				3.51	k star (bias corrected MLE)				3.34			
4129	Theta hat (MLE)				0.002	Theta star (bias corrected MLE)				0.002			
4130	nu hat (MLE)				400.5	nu star (bias corrected)				380.8			
4131	MLE Mean (bias corrected)				0.009	MLE Sd (bias corrected)				0.005			
4132						Adjusted Level of Significance (β)				0.04			
4133	Approximate Chi Square Value (380.80, α)				336.6	Adjusted Chi Square Value (380.80, β)				335.5			
4134	Gamma Approximate UCL (use when n>=50)				0.01	Gamma Adjusted UCL (use when n<50)				0.01			
4135													
4136	Lognormal GOF Test on Detected Observations Only												
4137	Shapiro Wilk Test Statistic				0.85	Shapiro Wilk GOF Test							
4138	5% Shapiro Wilk Critical Value				0.76	Detected Data appear Lognormal at 5% Significance Level							
4139	Lilliefors Test Statistic				0.27	Lilliefors GOF Test							
4140	5% Lilliefors Critical Value				0.39	Detected Data appear Lognormal at 5% Significance Level							
4141	Detected Data appear Lognormal at 5% Significance Level												
4142													
4143	Lognormal ROS Statistics Using Imputed Non-Detects												
4144	Mean in Original Scale				6.9558E	Mean in Log Scale				-7.27			
4145	SD in Original Scale				5.6041E	SD in Log Scale				0.07			
4146	95% t UCL (assumes normality of ROS data)				7.0799E	95% Percentile Bootstrap UCL				7.0778E			
4147	95% BCA Bootstrap UCL				7.0732E	95% Bootstrap t UCL				7.0914E			
4148	95% H-UCL (Log ROS)				N/A								
4149													
4150	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
4151	KM Mean (logged)				-7.27	95% H-UCL (KM -Log)				7.2350E			
4152	KM SD (logged)				0.14	95% Critical H Value (KM-Log)				1.70			
4153	KM Standard Error of Mean (logged)				0.07								
4154													
4155	DL/2 Statistics												
4156	DL/2 Normal					DL/2 Log-Transformed							
4157	Mean in Original Scale				6.7928E	Mean in Log Scale				-7.30			
4158	SD in Original Scale				9.5460E	SD in Log Scale				0.13			
4159	95% t UCL (Assumes normality)				7.0043E	95% H-Stat UCL				7.0002E			
4160	DL/2 is not a recommended method, provided for comparisons and historical reasons												
4161													
4162	Nonparametric Distribution Free UCL Statistics												
4163	Detected Data appear Normal Distributed at 5% Significance Level												
4164													
4165	Suggested UCL to Use												
4166	95% KM (t) UCL				7.9024E	95% KM (Percentile Bootstrap) UCL				8.0160E			
4167													
4168	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
4169	Recommendations are based upon data size, data distribution, and skewness.												
4170	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
4171	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												
4172													
4173	Tritium												
4174													
4175	General Statistics												
4176	Total Number of Observations				57	Number of Distinct Observations				57			
4177	Number of Detects				8	Number of Non-Detects				49			
4178	Number of Distinct Detects				8	Number of Distinct Non-Detects				49			
4179	Minimum Detect				0.01	Minimum Non-Detect				-0.058			
4180	Maximum Detect				0.98	Maximum Non-Detect				0.11			
4181	Variance Detects				0.11	Percent Non-Detects				85.9			
4182	Mean Detects				0.16	SD Detects				0.33			

	A	B	C	D	E	F	G	H	I	J	K	L
4183	Median Detects					0.03	CV Detects					2.07
4184	Skewness Detects					2.78	Kurtosis Detects					7.81
4185												
4186	Normal GOF Test on Detects Only											
4187	Shapiro Wilk Test Statistic					0.49	Shapiro Wilk GOF Test					
4188	5% Shapiro Wilk Critical Value					0.81	Detected Data Not Normal at 5% Significance Level					
4189	Lilliefors Test Statistic					0.45	Lilliefors GOF Test					
4190	5% Lilliefors Critical Value					0.31	Detected Data Not Normal at 5% Significance Level					
4191	Detected Data Not Normal at 5% Significance Level											
4192												
4193	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4194	Mean					-0.023	Standard Error of Mean					0.02
4195	SD					0.13	95% KM (BCA) UCL					0.03
4196	95% KM (t) UCL					0.01	95% KM (Percentile Bootstrap) UCL					0.02
4197	95% KM (z) UCL					0.009	95% KM Bootstrap t UCL					0.05
4198	90% KM Chebyshev UCL					0.03	95% KM Chebyshev UCL					0.06
4199	97.5% KM Chebyshev UCL					0.10	99% KM Chebyshev UCL					0.17
4200												
4201	Gamma GOF Tests on Detected Observations Only											
4202	A-D Test Statistic					1.04	Anderson-Darling GOF Test					
4203	5% A-D Critical Value					0.75	Detected Data Not Gamma Distributed at 5% Significance Level					
4204	K-S Test Statistic					0.34	Kolmogrov-Smirnoff GOF					
4205	5% K-S Critical Value					0.30	Detected Data Not Gamma Distributed at 5% Significance Level					
4206	Detected Data Not Gamma Distributed at 5% Significance Level											
4207												
4208	Gamma Statistics on Detected Data Only											
4209	k hat (MLE)					0.55	k star (bias corrected MLE)					0.42
4210	Theta hat (MLE)					0.29	Theta star (bias corrected MLE)					0.37
4211	nu hat (MLE)					8.84	nu star (bias corrected)					6.85
4212	MLE Mean (bias corrected)					0.16	MLE Sd (bias corrected)					0.24
4213												
4214	Gamma Kaplan-Meier (KM) Statistics											
4215	k hat (KM)					0.02	nu hat (KM)					3.18
4216							Adjusted Level of Significance (β)					0.04
4217	Approximate Chi Square Value (3.18, α)					0.42	Adjusted Chi Square Value (3.18, β)					0.40
4218	Approximate KM-UCL (use when n>=50)					-0.17	Gamma Adjusted KM-UCL (use when n<50)					-0.18
4219	Gamma (KM) may not be used when k hat (KM) is < 0.1											
4220												
4221	DL/2 Statistics											
4222	Mean in Original Scale					0.03	SD in Original Scale					0.13
4223	95% t UCL (Assumes normality)					0.05						
4224	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4225												
4226	Nonparametric Distribution Free UCL Statistics											
4227	Data do not follow a Discernible Distribution at 5% Significance Level											
4228												
4229	Suggested UCL to Use											
4230	99% KM (Chebyshev) UCL					0.17						
4231												
4232	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.											
4233	Recommendations are based upon data size, data distribution, and skewness.											
4234	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Singh.											
4235	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult the literature.											
4236												
4237	Uranium											
4238												
4239	General Statistics											
4240	Total Number of Observations					57	Number of Distinct Observations					55
4241	Number of Detects					56	Number of Non-Detects					1
4242	Number of Distinct Detects					54	Number of Distinct Non-Detects					1
4243	Minimum Detect					0.50	Minimum Non-Detect					0.04
4244	Maximum Detect					10.4	Maximum Non-Detect					0.04
4245	Variance Detects					2.53	Percent Non-Detects					1.75
4246	Mean Detects					2.11	SD Detects					1.59
4247	Median Detects					1.63	CV Detects					0.75
4248	Skewness Detects					2.95	Kurtosis Detects					12.6
4249	Mean of Logged Detects					0.55	SD of Logged Detects					0.6
4250												
4251	Normal GOF Test on Detects Only											
4252	Shapiro Wilk Test Statistic					0.74	Normal GOF Test on Detected Observations Only					
4253	5% Shapiro Wilk P Value					2.132E-05	Detected Data Not Normal at 5% Significance Level					
4254	Lilliefors Test Statistic					0.19	Lilliefors GOF Test					
4255	5% Lilliefors Critical Value					0.11	Detected Data Not Normal at 5% Significance Level					
4256	Detected Data Not Normal at 5% Significance Level											
4257												
4258	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4259	Mean					2.08	Standard Error of Mean					0.21
4260	SD					1.58	95% KM (BCA) UCL					2.43
4261	95% KM (t) UCL					2.43	95% KM (Percentile Bootstrap) UCL					2.44
4262	95% KM (z) UCL					2.42	95% KM Bootstrap t UCL					2.55
4263	90% KM Chebyshev UCL					2.71	95% KM Chebyshev UCL					3.00
4264	97.5% KM Chebyshev UCL					3.40	99% KM Chebyshev UCL					4.19

A	B	C	D	E	F	G	H	I	J	K	L
4265											
4266	Gamma GOF Tests on Detected Observations Only										
4267	A-D Test Statistic				0.82	Anderson-Darling GOF Test					
4268	5% A-D Critical Value				0.75	Detected Data Not Gamma Distributed at 5% Significance Level					
4269	K-S Test Statistic				0.10	Kolmogorov-Smirnov GOF					
4270	5% K-S Critical Value				0.12	Detected Data appear Gamma Distributed at 5% Significance Level					
4271	Detected data follow Appr. Gamma Distribution at 5% Significance Level										
4272											
4273	Gamma Statistics on Detected Data Only										
4274	k hat (MLE)				2.76	k star (bias corrected MLE)				2.62	
4275	Theta hat (MLE)				0.76	Theta star (bias corrected MLE)				0.80	
4276	nu hat (MLE)				309.8	nu star (bias corrected)				294.5	
4277	MLE Mean (bias corrected)				2.11	MLE Sd (bias corrected)				1.30	
4278											
4279	Gamma Kaplan-Meier (KM) Statistics										
4280	k hat (KM)				1.71	nu hat (KM)				195.8	
4281	Approximate Chi Square Value (195.77, α)				164.4	Adjusted Chi Square Value (195.77, β)				163.7	
4282	Approximate KM-UCL (use when n>=50)				2.47	Gamma Adjusted KM-UCL (use when n<50)				2.48	
4283											
4284	Gamma ROS Statistics using Imputed Non-Detects										
4285	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
4286	GROS may not be used when kstar of detected data is small such as < 0.1										
4287	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
4288	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
4289	Minimum				0.01	Mean				2.08	
4290	Maximum				10.4	Median				1.6	
4291	SD				1.60	CV				0.77	
4292	k hat (MLE)				2.04	k star (bias corrected MLE)				1.94	
4293	Theta hat (MLE)				1.01	Theta star (bias corrected MLE)				1.06	
4294	nu hat (MLE)				232.7	nu star (bias corrected)				221.8	
4295	MLE Mean (bias corrected)				2.08	MLE Sd (bias corrected)				1.49	
4296						Adjusted Level of Significance (β)				0.04	
4297	Approximate Chi Square Value (221.79, α)				188.3	Adjusted Chi Square Value (221.79, β)				187.5	
4298	Gamma Approximate UCL (use when n>=50)				2.44	Gamma Adjusted UCL (use when n<50)				2.46	
4299											
4300	Lognormal GOF Test on Detected Observations Only										
4301	Lilliefors Test Statistic				0.06	Lilliefors GOF Test					
4302	5% Lilliefors Critical Value				0.11	Detected Data appear Lognormal at 5% Significance Level					
4303	Detected Data appear Lognormal at 5% Significance Level										
4304											
4305	Lognormal ROS Statistics Using Imputed Non-Detects										
4306	Mean in Original Scale				2.08	Mean in Log Scale				0.53	
4307	SD in Original Scale				1.59	SD in Log Scale				0.63	
4308	95% t UCL (assumes normality of ROS data)				2.43	95% Percentile Bootstrap UCL				2.46	
4309	95% BCA Bootstrap UCL				2.52	95% Bootstrap t UCL				2.55	
4310	95% H-UCL (Log ROS)				2.45						
4311											
4312	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
4313	KM Mean (logged)				0.49	95% H-UCL (KM -Log)				2.71	
4314	KM SD (logged)				0.76	95% Critical H Value (KM-Log)				2.09	
4315	KM Standard Error of Mean (logged)				0.10						
4316											
4317	DL/2 Statistics										
4318	DL/2 Normal					DL/2 Log-Transformed					
4319	Mean in Original Scale				2.08	Mean in Log Scale				0.48	
4320	SD in Original Scale				1.60	SD in Log Scale				0.83	
4321	95% t UCL (Assumes normality)				2.43	95% H-Stat UCL				2.90	
4322	DL/2 is not a recommended method, provided for comparisons and historical reasons										
4323											
4324	Nonparametric Distribution Free UCL Statistics										
4325	Detected Data appear Approximate Gamma Distributed at 5% Significance Level										
4326											
4327	Suggested UCL to Use										
4328	95% KM (BCA) UCL				2.43	95% GROS Approximate Gamma UCL				2.44	
4329	95% Approximate Gamma KM-UCL				2.47						
4330											
4331	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.										
4332	Recommendations are based upon data size, data distribution, and skewness.										
4333	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Singh (2007).										
4334	These recommendations results will not cover all Real World data sets; for additional insight the user may want to consult the literature.										
4335											
4336											
4337	Uranium-234										
4338											
4339	General Statistics										
4340	Total Number of Observations				57	Number of Distinct Observations				49	
4341						Number of Missing Observations				0	
4342	Minimum				0.68	Mean				1.52	
4343	Maximum				6.1	Median				1.28	
4344	SD				0.92	Std. Error of Mean				0.12	
4345	Coefficient of Variation				0.61	Skewness				3.42	
4346											

A	B	C	D	E	F	G	H	I	J	K	L
4347	Normal GOF Test										
4348	Shapiro Wilk Test Statistic				0.55	Shapiro Wilk GOF Test					
4349	5% Shapiro Wilk P Value				0	Data Not Normal at 5% Significance Level					
4350	Lilliefors Test Statistic				0.33	Lilliefors GOF Test					
4351	5% Lilliefors Critical Value				0.11	Data Not Normal at 5% Significance Level					
4352	Data Not Normal at 5% Significance Level										
4353											
4354	Assuming Normal Distribution										
4355	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
4356	95% Student's-t UCL				1.72	95% Adjusted-CLT UCL (Chen-1995)					1.78
4357						95% Modified-t UCL (Johnson-1978)					1.73
4358											
4359	Gamma GOF Test										
4360	A-D Test Statistic				6.22	Anderson-Darling Gamma GOF Test					
4361	5% A-D Critical Value				0.75	Data Not Gamma Distributed at 5% Significance Level					
4362	K-S Test Statistic				0.27	Kolmogrov-Smirnoff Gamma GOF Test					
4363	5% K-S Critical Value				0.11	Data Not Gamma Distributed at 5% Significance Level					
4364	Data Not Gamma Distributed at 5% Significance Level										
4365											
4366	Gamma Statistics										
4367	k hat (MLE)				5.25	k star (bias corrected MLE)					4.99
4368	Theta hat (MLE)				0.28	Theta star (bias corrected MLE)					0.30
4369	nu hat (MLE)				599.5	nu star (bias corrected)					569.3
4370	MLE Mean (bias corrected)				1.52	MLE Sd (bias corrected)					0.68
4371						Approximate Chi Square Value (0.05)					515
4372	Adjusted Level of Significance				0.04	Adjusted Chi Square Value					513.6
4373											
4374	Assuming Gamma Distribution										
4375	Approximate Gamma UCL (use when n>=50))				1.68	Adjusted Gamma UCL (use when n<50)					1.68
4376											
4377	Lognormal GOF Test										
4378	Shapiro Wilk Test Statistic				0.78	Shapiro Wilk Lognormal GOF Test					
4379	5% Shapiro Wilk P Value				4.727E-	Data Not Lognormal at 5% Significance Level					
4380	Lilliefors Test Statistic				0.23	Lilliefors Lognormal GOF Test					
4381	5% Lilliefors Critical Value				0.11	Data Not Lognormal at 5% Significance Level					
4382	Data Not Lognormal at 5% Significance Level										
4383											
4384	Lognormal Statistics										
4385	Minimum of Logged Data				-0.38	Mean of logged Data					0.32
4386	Maximum of Logged Data				1.80	SD of logged Data					0.38
4387											
4388	Assuming Lognormal Distribution										
4389	95% H-UCL				1.63	90% Chebyshev (MVUE) UCL					1.72
4390	95% Chebyshev (MVUE) UCL				1.83	97.5% Chebyshev (MVUE) UCL					1.97
4391	99% Chebyshev (MVUE) UCL				2.27						
4392											
4393	Nonparametric Distribution Free UCL Statistics										
4394	Data do not follow a Discernible Distribution (0.05)										
4395											
4396	Nonparametric Distribution Free UCLs										
4397	95% CLT UCL				1.72	95% Jackknife UCL					1.72
4398	95% Standard Bootstrap UCL				1.71	95% Bootstrap-t UCL					1.84
4399	95% Hall's Bootstrap UCL				1.81	95% Percentile Bootstrap UCL					1.72
4400	95% BCA Bootstrap UCL				1.79						
4401	90% Chebyshev(Mean, Sd) UCL				1.88	95% Chebyshev(Mean, Sd) UCL					2.05
4402	97.5% Chebyshev(Mean, Sd) UCL				2.28	99% Chebyshev(Mean, Sd) UCL					2.74
4403											
4404	Suggested UCL to Use										
4405	95% Student's-t UCL				1.72	or 95% Modified-t UCL					1.73
4406											
4407	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL. Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh (2003). However, simulations results will not cover all Real World data sets. For additional insight the user may want to consult a statistician.										
4408											
4409											
4410											
4411											
4412	Uranium-235/236										
4413											
4414	General Statistics										
4415	Total Number of Observations				57	Number of Distinct Observations					56
4416	Number of Detects				22	Number of Non-Detects					35
4417	Number of Distinct Detects				21	Number of Distinct Non-Detects					35
4418	Minimum Detect				0.045	Minimum Non-Detect					0.027
4419	Maximum Detect				0.27	Maximum Non-Detect					0.12
4420	Variance Detects				0.002	Percent Non-Detects					61.4%
4421	Mean Detects				0.12	SD Detects					0.05
4422	Median Detects				0.12	CV Detects					0.40
4423	Skewness Detects				1.06	Kurtosis Detects					1.90
4424	Mean of Logged Detects				-2.13	SD of Logged Detects					0.40
4425											
4426	Normal GOF Test on Detects Only										
4427	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test					
4428	5% Shapiro Wilk Critical Value				0.91	Detected Data appear Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L	
4429	Lilliefors Test Statistic					0.10	Lilliefors GOF Test						
4430	5% Lilliefors Critical Value					0.18	Detected Data appear Normal at 5% Significance Level						
4431	Detected Data appear Normal at 5% Significance Level												
4432													
4433	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
4434	Mean					0.06	Standard Error of Mean					0.008	
4435	SD					0.05	95% KM (BCA) UCL					0.08	
4436	95% KM (t) UCL					0.08	95% KM (Percentile Bootstrap) UCL					0.08	
4437	95% KM (z) UCL					0.07	95% KM Bootstrap t UCL					0.08	
4438	90% KM Chebyshev UCL					0.09	95% KM Chebyshev UCL					0.10	
4439	97.5% KM Chebyshev UCL					0.11	99% KM Chebyshev UCL					0.14	
4440													
4441	Gamma GOF Tests on Detected Observations Only												
4442	A-D Test Statistic					0.14	Anderson-Darling GOF Test						
4443	5% A-D Critical Value					0.74	data appear Gamma Distributed at 5% Significance Level						
4444	K-S Test Statistic					0.06	Kolmogrov-Smirnoff GOF						
4445	5% K-S Critical Value					0.18	data appear Gamma Distributed at 5% Significance Level						
4446	Detected data appear Gamma Distributed at 5% Significance Level												
4447													
4448	Gamma Statistics on Detected Data Only												
4449	k hat (MLE)					6.68	k star (bias corrected MLE)					5.80	
4450	Theta hat (MLE)					0.01	Theta star (bias corrected MLE)					0.02	
4451	nu hat (MLE)					294	nu star (bias corrected)					255.3	
4452	MLE Mean (bias corrected)					0.12	MLE Sd (bias corrected)					0.05	
4453													
4454	Gamma Kaplan-Meier (KM) Statistics												
4455	k hat (KM)					1.23	nu hat (KM)					141.3	
4456	Approximate Chi Square Value (141.28, α)					114.8	Adjusted Chi Square Value (141.28, β)					114.2	
4457	Approximate KM-UCL (use when $n \geq 50$)					0.08	Gamma Adjusted KM-UCL (use when $n < 50$)					0.08	
4458													
4459	Gamma ROS Statistics using Imputed Non-Detects												
4460	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
4461	GROS may not be used when kstar of detected data is small such as < 0.1												
4462	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
4463	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
4464	Minimum					0.01	Mean					0.05	
4465	Maximum					0.27	Median					0.01	
4466	SD					0.06	CV					1.13	
4467	k hat (MLE)					0.87	k star (bias corrected MLE)					0.83	
4468	Theta hat (MLE)					0.06	Theta star (bias corrected MLE)					0.06	
4469	nu hat (MLE)					99.2	nu star (bias corrected)					95.3	
4470	MLE Mean (bias corrected)					0.05	MLE Sd (bias corrected)					0.06	
4471							Adjusted Level of Significance (β)					0.04	
4472	Approximate Chi Square Value (95.35, α)					73.8	Adjusted Chi Square Value (95.35, β)					73.3	
4473	Gamma Approximate UCL (use when $n \geq 50$)					0.07	Gamma Adjusted UCL (use when $n < 50$)					0.07	
4474													
4475	Lognormal GOF Test on Detected Observations Only												
4476	Shapiro Wilk Test Statistic					0.98	Shapiro Wilk GOF Test						
4477	5% Shapiro Wilk Critical Value					0.91	Detected Data appear Lognormal at 5% Significance Level						
4478	Lilliefors Test Statistic					0.09	Lilliefors GOF Test						
4479	5% Lilliefors Critical Value					0.18	Detected Data appear Lognormal at 5% Significance Level						
4480	Detected Data appear Lognormal at 5% Significance Level												
4481													
4482	Lognormal ROS Statistics Using Imputed Non-Detects												
4483	Mean in Original Scale					0.07	Mean in Log Scale					-2.79	
4484	SD in Original Scale					0.05	SD in Log Scale					0.58	
4485	95% t UCL (assumes normality of ROS data)					0.08	95% Percentile Bootstrap UCL					0.08	
4486	95% BCA Bootstrap UCL					0.08	95% Bootstrap t UCL					0.08	
4487	95% H-UCL (Log ROS)					0.08							
4488													
4489	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
4490	KM Mean (logged)					-3.07	95% H-UCL (KM -Log)					0.08	
4491	KM SD (logged)					0.82	95% Critical H Value (KM-Log)					2.15	
4492	KM Standard Error of Mean (logged)					0.12							
4493													
4494	DL/2 Statistics												
4495	DL/2 Normal						DL/2 Log-Transformed						
4496	Mean in Original Scale					0.06	Mean in Log Scale					-3.00	
4497	SD in Original Scale					0.05	SD in Log Scale					0.80	
4498	95% t UCL (Assumes normality)					0.08	95% H-Stat UCL					0.08	
4499	DL/2 is not a recommended method, provided for comparisons and historical reasons												
4500													
4501	Nonparametric Distribution Free UCL Statistics												
4502	Detected Data appear Normal Distributed at 5% Significance Level												
4503													
4504	Suggested UCL to Use												
4505	95% KM (t) UCL					0.08	95% KM (Percentile Bootstrap) UCL					0.08	
4506													
4507	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
4508	Recommendations are based upon data size, data distribution, and skewness.												
4509	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
4510	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												

	A	B	C	D	E	F	G	H	I	J	K	L
4511												
4512												
4513	Uranium-238											
4514												
4515	General Statistics											
4516	Total Number of Observations					57	Number of Distinct Observations					47
4517							Number of Missing Observations					0
4518	Minimum					1	Mean					1.75
4519	Maximum					5.17	Median					1.54
4520	SD					0.79	Std. Error of Mean					0.10
4521	Coefficient of Variation					0.45	Skewness					2.71
4522												
4523	Normal GOF Test											
4524	Shapiro Wilk Test Statistic					0.68	Shapiro Wilk GOF Test					
4525	5% Shapiro Wilk P Value					1.443E-	Data Not Normal at 5% Significance Level					
4526	Lilliefors Test Statistic					0.25	Lilliefors GOF Test					
4527	5% Lilliefors Critical Value					0.11	Data Not Normal at 5% Significance Level					
4528	Data Not Normal at 5% Significance Level											
4529												
4530	Assuming Normal Distribution											
4531	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
4532	95% Student's-t UCL					1.93	95% Adjusted-CLT UCL (Chen-1995)					1.96
4533							95% Modified-t UCL (Johnson-1978)					1.93
4534												
4535	Gamma GOF Test											
4536	A-D Test Statistic					3.53	Anderson-Darling Gamma GOF Test					
4537	5% A-D Critical Value					0.75	Data Not Gamma Distributed at 5% Significance Level					
4538	K-S Test Statistic					0.19	Kolmogrov-Smirnoff Gamma GOF Test					
4539	5% K-S Critical Value					0.11	Data Not Gamma Distributed at 5% Significance Level					
4540	Data Not Gamma Distributed at 5% Significance Level											
4541												
4542	Gamma Statistics											
4543	k hat (MLE)					7.72	k star (bias corrected MLE)					7.33
4544	Theta hat (MLE)					0.22	Theta star (bias corrected MLE)					0.23
4545	nu hat (MLE)					880.9	nu star (bias corrected)					835.8
4546	MLE Mean (bias corrected)					1.75	MLE Sd (bias corrected)					0.64
4547							Approximate Chi Square Value (0.05)					769.7
4548	Adjusted Level of Significance					0.045	Adjusted Chi Square Value					768.1
4549												
4550	Assuming Gamma Distribution											
4551	Approximate Gamma UCL (use when n>=50))					1.90	Adjusted Gamma UCL (use when n<50)					1.90
4552												
4553	Lognormal GOF Test											
4554	Shapiro Wilk Test Statistic					0.85	Shapiro Wilk Lognormal GOF Test					
4555	5% Shapiro Wilk P Value					2.9039E-	Data Not Lognormal at 5% Significance Level					
4556	Lilliefors Test Statistic					0.15	Lilliefors Lognormal GOF Test					
4557	5% Lilliefors Critical Value					0.11	Data Not Lognormal at 5% Significance Level					
4558	Data Not Lognormal at 5% Significance Level											
4559												
4560	Lognormal Statistics											
4561	Minimum of Logged Data					0	Mean of logged Data					0.49
4562	Maximum of Logged Data					1.64	SD of logged Data					0.33
4563												
4564	Assuming Lognormal Distribution											
4565	95% H-UCL					1.87	90% Chebyshev (MVUE) UCL					1.97
4566	95% Chebyshev (MVUE) UCL					2.07	97.5% Chebyshev (MVUE) UCL					2.22
4567	99% Chebyshev (MVUE) UCL					2.52						
4568												
4569	Nonparametric Distribution Free UCL Statistics											
4570	Data do not follow a Discernible Distribution (0.05)											
4571												
4572	Nonparametric Distribution Free UCLs											
4573	95% CLT UCL					1.92	95% Jackknife UCL					1.93
4574	95% Standard Bootstrap UCL					1.92	95% Bootstrap-t UCL					1.97
4575	95% Hall's Bootstrap UCL					1.98	95% Percentile Bootstrap UCL					1.94
4576	95% BCA Bootstrap UCL					1.97						
4577	90% Chebyshev(Mean, Sd) UCL					2.06	95% Chebyshev(Mean, Sd) UCL					2.21
4578	97.5% Chebyshev(Mean, Sd) UCL					2.40	99% Chebyshev(Mean, Sd) UCL					2.79
4579												
4580	Suggested UCL to Use											
4581	95% Student's-t UCL					1.93	or 95% Modified-t UCL					1.93
4582												
4583	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4584	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
4585	Singh and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
4586	For additional insight the user may want to consult a statistician.											
4587												
4588												
4589	Vanadium											
4590												
4591	General Statistics											
4592	Total Number of Observations					57	Number of Distinct Observations					48

	A	B	C	D	E	F	G	H	I	J	K	L
4593							Number of Missing Observations					0
4594					Minimum	2.46					Mean	12.6
4595					Maximum	22.5					Median	12.1
4596					SD	3.96					Std. Error of Mean	0.52
4597					Coefficient of Variation	0.31					Skewness	0.47
4598												
4599					Normal GOF Test							
4600					Shapiro Wilk Test Statistic	0.96				Shapiro Wilk GOF Test		
4601					5% Shapiro Wilk P Value	0.17				Data appear Normal at 5% Significance Level		
4602					Lilliefors Test Statistic	0.1				Lilliefors GOF Test		
4603					5% Lilliefors Critical Value	0.11				Data appear Normal at 5% Significance Level		
4604					Data appear Normal at 5% Significance Level							
4605												
4606					Assuming Normal Distribution							
4607					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
4608					95% Student's-t UCL	13.5				95% Adjusted-CLT UCL (Chen-1995)		13.5
4609										95% Modified-t UCL (Johnson-1978)		13.5
4610												
4611					Gamma GOF Test							
4612					A-D Test Statistic	0.40				Anderson-Darling Gamma GOF Test		
4613					5% A-D Critical Value	0.75				data appear Gamma Distributed at 5% Significance Level		
4614					K-S Test Statistic	0.07				Kolmogrov-Smirnoff Gamma GOF Test		
4615					5% K-S Critical Value	0.11				data appear Gamma Distributed at 5% Significance Level		
4616					Detected data appear Gamma Distributed at 5% Significance Level							
4617												
4618					Gamma Statistics							
4619					k hat (MLE)	9.47				k star (bias corrected MLE)		8.98
4620					Theta hat (MLE)	1.33				Theta star (bias corrected MLE)		1.40
4621					nu hat (MLE)	1080				nu star (bias corrected)		1025
4622					MLE Mean (bias corrected)	12.6				MLE Sd (bias corrected)		4.22
4623										Approximate Chi Square Value (0.05)		951.3
4624					Adjusted Level of Significance	0.04				Adjusted Chi Square Value		949.5
4625												
4626					Assuming Gamma Distribution							
4627					Approximate Gamma UCL (use when n>=50))	13.6				Adjusted Gamma UCL (use when n<50)		13.6
4628												
4629					Lognormal GOF Test							
4630					Shapiro Wilk Test Statistic	0.91				Shapiro Wilk Lognormal GOF Test		
4631					5% Shapiro Wilk P Value	3.0098E-05				Data Not Lognormal at 5% Significance Level		
4632					Lilliefors Test Statistic	0.07				Lilliefors Lognormal GOF Test		
4633					5% Lilliefors Critical Value	0.11				Data appear Lognormal at 5% Significance Level		
4634					Data appear Approximate Lognormal at 5% Significance Level							
4635												
4636					Lognormal Statistics							
4637					Minimum of Logged Data	0.9				Mean of logged Data		2.48
4638					Maximum of Logged Data	3.11				SD of logged Data		0.35
4639												
4640					Assuming Lognormal Distribution							
4641					95% H-UCL	13.8				90% Chebyshev (MVUE) UCL		14.5
4642					95% Chebyshev (MVUE) UCL	15.4				97.5% Chebyshev (MVUE) UCL		16.5
4643					99% Chebyshev (MVUE) UCL	18.8						
4644												
4645					Nonparametric Distribution Free UCL Statistics							
4646					Data appear to follow a Discernible Distribution at 5% Significance Level							
4647												
4648					Nonparametric Distribution Free UCLs							
4649					95% CLT UCL	13.5				95% Jackknife UCL		13.5
4650					95% Standard Bootstrap UCL	13.5				95% Bootstrap-t UCL		13.5
4651					95% Hall's Bootstrap UCL	13.5				95% Percentile Bootstrap UCL		13.5
4652					95% BCA Bootstrap UCL	13.5						
4653					90% Chebyshev(Mean, Sd) UCL	14.2				95% Chebyshev(Mean, Sd) UCL		14.9
4654					97.5% Chebyshev(Mean, Sd) UCL	15.9				99% Chebyshev(Mean, Sd) UCL		17.8
4655												
4656					Suggested UCL to Use							
4657					95% Student's-t UCL	13.5						
4658												
4659					Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.							
4660					Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh and Singh (2003). However, simulations results will not cover all Real World data sets							
4661					For additional insight the user may want to consult a statistician.							
4662												
4663												
4664					Xylene[1,3-]+Xylene[1,4-]							
4665												
4666					General Statistics							
4667					Total Number of Observations	57				Number of Distinct Observations		44
4668					Number of Detects	8				Number of Non-Detects		49
4669					Number of Distinct Detects	8				Number of Distinct Non-Detects		36
4670					Minimum Detect	4.3000E-05				Minimum Non-Detect		0.002
4671					Maximum Detect	9.6000E-05				Maximum Non-Detect		0.003
4672					Variance Detects	4.2655E-05				Percent Non-Detects		85.9
4673					Mean Detects	6.4225E-05				SD Detects		2.0653E-05
4674					Median Detects	6.2150E-05				CV Detects		0.32

	A	B	C	D	E	F	G	H	I	J	K	L
4675	Skewness Detects					0.32	Kurtosis Detects					-1.68
4676	Mean of Logged Detects					-7.39	SD of Logged Detects					0.32
4677												
4678	Normal GOF Test on Detects Only											
4679	Shapiro Wilk Test Statistic					0.88	Shapiro Wilk GOF Test					
4680	5% Shapiro Wilk Critical Value					0.81	Detected Data appear Normal at 5% Significance Level					
4681	Lilliefors Test Statistic					0.21	Lilliefors GOF Test					
4682	5% Lilliefors Critical Value					0.31	Detected Data appear Normal at 5% Significance Level					
4683	Detected Data appear Normal at 5% Significance Level											
4684												
4685	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4686	Mean					6.4225E	Standard Error of Mean					7.3019E
4687	SD					1.9319E	95% KM (BCA) UCL					7.6267E
4688	95% KM (t) UCL					7.6438E	95% KM (Percentile Bootstrap) UCL					7.6350E
4689	95% KM (z) UCL					7.6236E	95% KM Bootstrap t UCL					7.8926E
4690	90% KM Chebyshev UCL					8.6131E	95% KM Chebyshev UCL					9.6053E
4691	97.5% KM Chebyshev UCL					0.001	99% KM Chebyshev UCL					0.001
4692												
4693	Gamma GOF Tests on Detected Observations Only											
4694	A-D Test Statistic					0.53	Anderson-Darling GOF Test					
4695	5% A-D Critical Value					0.71	Data appear Gamma Distributed at 5% Significance Level					
4696	K-S Test Statistic					0.21	Kolmogrov-Smirnoff GOF					
4697	5% K-S Critical Value					0.29	Data appear Gamma Distributed at 5% Significance Level					
4698	Detected data appear Gamma Distributed at 5% Significance Level											
4699												
4700	Gamma Statistics on Detected Data Only											
4701	k hat (MLE)					11.04	k star (bias corrected MLE)					7.01
4702	Theta hat (MLE)					5.7887E	Theta star (bias corrected MLE)					9.1519E
4703	nu hat (MLE)					177.5	nu star (bias corrected)					112.3
4704	MLE Mean (bias corrected)					6.4225E	MLE Sd (bias corrected)					2.4244E
4705												
4706	Gamma Kaplan-Meier (KM) Statistics											
4707	k hat (KM)					11.04	nu hat (KM)					1260
4708	Approximate Chi Square Value (N/A, α)					1178	Adjusted Chi Square Value (N/A, β)					1176
4709	Approximate KM-UCL (use when n>=50)					6.8662E	Gamma Adjusted KM-UCL (use when n<50)					6.8780E
4710												
4711	Gamma ROS Statistics using Imputed Non-Detects											
4712	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
4713	GROS may not be used when kstar of detected data is small such as < 0.1											
4714	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
4715	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
4716	Minimum					4.3000E	Mean					0.008
4717	Maximum					0.01	Median					0.01
4718	SD					0.003	CV					0.37
4719	k hat (MLE)					2.14	k star (bias corrected MLE)					2.04
4720	Theta hat (MLE)					0.004	Theta star (bias corrected MLE)					0.004
4721	nu hat (MLE)					244.5	nu star (bias corrected)					232.9
4722	MLE Mean (bias corrected)					0.008	MLE Sd (bias corrected)					0.006
4723							Adjusted Level of Significance (β)					0.04
4724	Approximate Chi Square Value (232.92, α)					198.6	Adjusted Chi Square Value (232.92, β)					197.8
4725	Gamma Approximate UCL (use when n>=50)					0.016	Gamma Adjusted UCL (use when n<50)					0.01
4726												
4727	Lognormal GOF Test on Detected Observations Only											
4728	Shapiro Wilk Test Statistic					0.87	Shapiro Wilk GOF Test					
4729	5% Shapiro Wilk Critical Value					0.81	Detected Data appear Lognormal at 5% Significance Level					
4730	Lilliefors Test Statistic					0.19	Lilliefors GOF Test					
4731	5% Lilliefors Critical Value					0.31	Detected Data appear Lognormal at 5% Significance Level					
4732	Detected Data appear Lognormal at 5% Significance Level											
4733												
4734	Lognormal ROS Statistics Using Imputed Non-Detects											
4735	Mean in Original Scale					6.2139E	Mean in Log Scale					-7.39
4736	SD in Original Scale					1.0113E	SD in Log Scale					0.16
4737	95% t UCL (assumes normality of ROS data)					6.4379E	95% Percentile Bootstrap UCL					6.4314E
4738	95% BCA Bootstrap UCL					6.4449E	95% Bootstrap t UCL					6.4490E
4739	95% H-UCL (Log ROS)					6.4479E						
4740												
4741	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
4742	KM Mean (logged)					-7.39	95% H-UCL (KM -Log)					6.8801E
4743	KM SD (logged)					0.30	95% Critical H Value (KM-Log)					1.69
4744	KM Standard Error of Mean (logged)					0.11						
4745												
4746	DL/2 Statistics											
4747	DL/2 Normal						DL/2 Log-Transformed					
4748	Mean in Original Scale					0.001	Mean in Log Scale					-6.73
4749	SD in Original Scale					2.9385E	SD in Log Scale					0.31
4750	95% t UCL (Assumes normality)					0.001	95% H-Stat UCL					0.001
4751	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4752												
4753	Nonparametric Distribution Free UCL Statistics											
4754	Detected Data appear Normal Distributed at 5% Significance Level											
4755												
4756	Suggested UCL to Use											

A	B	C	D	E	F	G	H	I	J	K	L
4757	95% KM (t) UCL				7.6438E	95% KM (Percentile Bootstrap) UCL				7.6350E	
4758											
4759	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
4760	Recommendations are based upon data size, data distribution, and skewness.										
4761	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
4762	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult										
4763											
4764											
4765	Zinc										
4766											
4767	General Statistics										
4768	Total Number of Observations				57	Number of Distinct Observations				53	
4769						Number of Missing Observations				0	
4770	Minimum				24.9	Mean				89.6	
4771	Maximum				1320	Median				42.7	
4772	SD				205	Std. Error of Mean				27.1	
4773	Coefficient of Variation				2.28	Skewness				5.29	
4774											
4775	Normal GOF Test										
4776	Shapiro Wilk Test Statistic				0.28	Shapiro Wilk GOF Test					
4777	5% Shapiro Wilk P Value				0	Data Not Normal at 5% Significance Level					
4778	Lilliefors Test Statistic				0.39	Lilliefors GOF Test					
4779	5% Lilliefors Critical Value				0.11	Data Not Normal at 5% Significance Level					
4780	Data Not Normal at 5% Significance Level										
4781											
4782	Assuming Normal Distribution										
4783	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
4784	95% Student's-t UCL				135	95% Adjusted-CLT UCL (Chen-1995)				154.6	
4785						95% Modified-t UCL (Johnson-1978)				138.2	
4786											
4787	Gamma GOF Test										
4788	A-D Test Statistic				10.14	Anderson-Darling Gamma GOF Test					
4789	5% A-D Critical Value				0.77	Data Not Gamma Distributed at 5% Significance Level					
4790	K-S Test Statistic				0.30	Kolmogorov-Smirnov Gamma GOF Test					
4791	5% K-S Critical Value				0.12	Data Not Gamma Distributed at 5% Significance Level					
4792	Data Not Gamma Distributed at 5% Significance Level										
4793											
4794	Gamma Statistics										
4795	k hat (MLE)				1.07	k star (bias corrected MLE)				1.03	
4796	Theta hat (MLE)				83.1	Theta star (bias corrected MLE)				86.7	
4797	nu hat (MLE)				123	nu star (bias corrected)				117.8	
4798	MLE Mean (bias corrected)				89.6	MLE Sd (bias corrected)				88.1	
4799						Approximate Chi Square Value (0.05)				93.7	
4800	Adjusted Level of Significance				0.04	Adjusted Chi Square Value				93.2	
4801											
4802	Assuming Gamma Distribution										
4803	Approximate Gamma UCL (use when n>=50)				112.6	Adjusted Gamma UCL (use when n<50)				113.3	
4804											
4805	Lognormal GOF Test										
4806	Shapiro Wilk Test Statistic				0.67	Shapiro Wilk Lognormal GOF Test					
4807	5% Shapiro Wilk P Value				7.772E-	Data Not Lognormal at 5% Significance Level					
4808	Lilliefors Test Statistic				0.20	Lilliefors Lognormal GOF Test					
4809	5% Lilliefors Critical Value				0.11	Data Not Lognormal at 5% Significance Level					
4810	Data Not Lognormal at 5% Significance Level										
4811											
4812	Lognormal Statistics										
4813	Minimum of Logged Data				3.21	Mean of logged Data				3.96	
4814	Maximum of Logged Data				7.18	SD of logged Data				0.70	
4815											
4816	Assuming Lognormal Distribution										
4817	95% H-UCL				82.0	90% Chebyshev (MVUE) UCL				88.0	
4818	95% Chebyshev (MVUE) UCL				97.4	97.5% Chebyshev (MVUE) UCL				110.5	
4819	99% Chebyshev (MVUE) UCL				136.1						
4820											
4821	Nonparametric Distribution Free UCL Statistics										
4822	Data do not follow a Discernible Distribution (0.05)										
4823											
4824	Nonparametric Distribution Free UCLs										
4825	95% CLT UCL				134.3	95% Jackknife UCL				135	
4826	95% Standard Bootstrap UCL				133.8	95% Bootstrap-t UCL				396.6	
4827	95% Hall's Bootstrap UCL				346.1	95% Percentile Bootstrap UCL				134.8	
4828	95% BCA Bootstrap UCL				160.2						
4829	90% Chebyshev(Mean, Sd) UCL				171.1	95% Chebyshev(Mean, Sd) UCL				208	
4830	97.5% Chebyshev(Mean, Sd) UCL				259.2	99% Chebyshev(Mean, Sd) UCL				359.8	
4831											
4832	Suggested UCL to Use										
4833	95% Chebyshev (Mean, Sd) UCL				208						
4834											
4835	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
4836	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and										
4837	Singh and Singh and Singh (2003). However, simulations results will not cover all Real World data sets										
4838	For additional insight the user may want to consult a statistician.										

	A	B	C	D	E	F	G	H	I	J	K	L
4839												

	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Data Sets with Non-Detects											
2												
3	User Selected Options											
4	e/Time of Computation			9/1/2015 2:28:46 PM								
5	From File			ProUCLinput_36-008_0-5.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	f Bootstrap Operations			2000								
9												
10	Acenaphthene											
11												
12	General Statistics											
13	Total Number of Observations			107	Number of Distinct Observations			99				
14	Number of Detects			21	Number of Non-Detects			86				
15	Number of Distinct Detects			21	Number of Distinct Non-Detects			78				
16	Minimum Detect			0.012	Minimum Non-Detect			0.034				
17	Maximum Detect			3.43	Maximum Non-Detect			1.81				
18	Variance Detects			0.57	Percent Non-Detects			80.3				
19	Mean Detects			0.38	SD Detects			0.75				
20	Median Detects			0.09	CV Detects			1.94				
21	Skewness Detects			3.55	Kurtosis Detects			14.0				
22	Mean of Logged Detects			-2.09	SD of Logged Detects			1.52				
23												
24	Normal GOF Test on Detects Only											
25	Shapiro Wilk Test Statistic			0.51	Shapiro Wilk GOF Test							
26	5% Shapiro Wilk Critical Value			0.90	Detected Data Not Normal at 5% Significance Level							
27	Lilliefors Test Statistic			0.31	Lilliefors GOF Test							
28	5% Lilliefors Critical Value			0.19	Detected Data Not Normal at 5% Significance Level							
29	Detected Data Not Normal at 5% Significance Level											
30												
31	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
32	Mean			0.094	Standard Error of Mean			0.034				
33	SD			0.35	95% KM (BCA) UCL			0.16				
34	95% KM (t) UCL			0.15	95% KM (Percentile Bootstrap) UCL			0.16				
35	95% KM (z) UCL			0.15	95% KM Bootstrap t UCL			0.24				
36	90% KM Chebyshev UCL			0.20	95% KM Chebyshev UCL			0.25				
37	97.5% KM Chebyshev UCL			0.31	99% KM Chebyshev UCL			0.45				
38												
39	Gamma GOF Tests on Detected Observations Only											
40	A-D Test Statistic			1.16	Anderson-Darling GOF Test							
41	5% A-D Critical Value			0.80	ed Data Not Gamma Distributed at 5% Significanc							
42	K-S Test Statistic			0.26	Kolmogrov-Smirnoff GOF							
43	5% K-S Critical Value			0.2	ed Data Not Gamma Distributed at 5% Significanc							
44	Detected Data Not Gamma Distributed at 5% Significance Level											
45												
46	Gamma Statistics on Detected Data Only											
47	k hat (MLE)			0.54	k star (bias corrected MLE)			0.5				
48	Theta hat (MLE)			0.71	Theta star (bias corrected MLE)			0.77				
49	nu hat (MLE)			22.94	nu star (bias corrected)			21.0				
50	MLE Mean (bias corrected)			0.38	MLE Sd (bias corrected)			0.55				
51												
52	Gamma Kaplan-Meier (KM) Statistics											
53	k hat (KM)			0.06	nu hat (KM)			14.8				
54	Approximate Chi Square Value (14.88, α)			7.17	Adjusted Chi Square Value (14.88, β)			7.10				
55	Approximate KM-UCL (use when $n \geq 50$)			0.19	Gamma Adjusted KM-UCL (use when $n < 50$)			0.19				
56	Gamma (KM) may not be used when k hat (KM) is < 0.1											
57												
58	Gamma ROS Statistics using Imputed Non-Detects											
59	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
60	GROS may not be used when kstar of detected data is small such as < 0.1											
61	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
62	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
63	Minimum			0.01	Mean			0.08				

	A	B	C	D	E	F	G	H	I	J	K	L
64	Maximum					3.43	Median					0.01
65	SD					0.36	CV					4.29
66	k hat (MLE)					0.40	k star (bias corrected MLE)					0.39
67	Theta hat (MLE)					0.21	Theta star (bias corrected MLE)					0.21
68	nu hat (MLE)					85.8	nu star (bias corrected)					84.7
69	MLE Mean (bias corrected)					0.08	MLE Sd (bias corrected)					0.13
70							Adjusted Level of Significance (β)					0.04
71	Approximate Chi Square Value (84.79, α)					64.5	Adjusted Chi Square Value (84.79, β)					64.3
72	Normal Approximate UCL (use when $n \geq 50$)					0.11	Gamma Adjusted UCL (use when $n < 50$)					0.11
73												
74	Lognormal GOF Test on Detected Observations Only											
75	Shapiro Wilk Test Statistic					0.94	Shapiro Wilk GOF Test					
76	5% Shapiro Wilk Critical Value					0.90	Detected Data appear Lognormal at 5% Significance Level					
77	Lilliefors Test Statistic					0.17	Lilliefors GOF Test					
78	5% Lilliefors Critical Value					0.19	Detected Data appear Lognormal at 5% Significance Level					
79	Detected Data appear Lognormal at 5% Significance Level											
80												
81	Lognormal ROS Statistics Using Imputed Non-Detects											
82	Mean in Original Scale					0.08	Mean in Log Scale					-3.71
83	SD in Original Scale					0.36	SD in Log Scale					1.07
84	95% t UCL (assumes normality of ROS data)					0.14	95% Percentile Bootstrap UCL					0.14
85	95% BCA Bootstrap UCL					0.20	95% Bootstrap t UCL					0.23
86	95% H-UCL (Log ROS)					0.05						
87												
88	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
89	KM Mean (logged)					-3.55	95% H-UCL (KM -Log)					0.06
90	KM SD (logged)					1.06	95% Critical H Value (KM-Log)					2.27
91	KM Standard Error of Mean (logged)					0.19						
92												
93	DL/2 Statistics											
94	DL/2 Normal						DL/2 Log-Transformed					
95	Mean in Original Scale					0.10	Mean in Log Scale					-3.33
96	SD in Original Scale					0.36	SD in Log Scale					1.05
97	95% t UCL (Assumes normality)					0.16	95% H-Stat UCL					0.07
98	DL/2 is not a recommended method, provided for comparisons and historical reasons											
99												
100	Nonparametric Distribution Free UCL Statistics											
101	Detected Data appear Lognormal Distributed at 5% Significance Level											
102												
103	Suggested UCL to Use											
104	95% KM (Chebyshev) UCL					0.25						
105												
106	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.											
107	Recommendations are based upon data size, data distribution, and skewness.											
108	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Singh (2007).											
109	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult the literature.											
110												
111	Acetone											
112												
113	General Statistics											
114	Total Number of Observations					107	Number of Distinct Observations					94
115	Number of Detects					14	Number of Non-Detects					93
116	Number of Distinct Detects					13	Number of Distinct Non-Detects					81
117	Minimum Detect					0.002	Minimum Non-Detect					0.002
118	Maximum Detect					0.03	Maximum Non-Detect					0.01
119	Variance Detects					1.1033E	Percent Non-Detects					86.9
120	Mean Detects					0.008	SD Detects					0.01
121	Median Detects					0.004	CV Detects					1.28
122	Skewness Detects					2.55	Kurtosis Detects					6.31
123	Mean of Logged Detects					-5.23	SD of Logged Detects					0.82
124												
125	Normal GOF Test on Detects Only											
126	Shapiro Wilk Test Statistic					0.58	Shapiro Wilk GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L	
127	5% Shapiro Wilk Critical Value					0.87	Detected Data Not Normal at 5% Significance Level						
128	Lilliefors Test Statistic					0.36	Lilliefors GOF Test						
129	5% Lilliefors Critical Value					0.23	Detected Data Not Normal at 5% Significance Level						
130	Detected Data Not Normal at 5% Significance Level												
131													
132	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
133	Mean					0.003	Standard Error of Mean					4.5984E	
134	SD					0.004	95% KM (BCA) UCL					0.004	
135	95% KM (t) UCL					0.004	95% KM (Percentile Bootstrap) UCL					0.004	
136	95% KM (z) UCL					0.004	95% KM Bootstrap t UCL					0.004	
137	90% KM Chebyshev UCL					0.005	95% KM Chebyshev UCL					0.005	
138	97.5% KM Chebyshev UCL					0.006	99% KM Chebyshev UCL					0.008	
139													
140	Gamma GOF Tests on Detected Observations Only												
141	A-D Test Statistic					1.64	Anderson-Darling GOF Test						
142	5% A-D Critical Value					0.75	Detected Data Not Gamma Distributed at 5% Significance Level						
143	K-S Test Statistic					0.32	Kolmogrov-Smirnoff GOF						
144	5% K-S Critical Value					0.23	Detected Data Not Gamma Distributed at 5% Significance Level						
145	Detected Data Not Gamma Distributed at 5% Significance Level												
146													
147	Gamma Statistics on Detected Data Only												
148	k hat (MLE)					1.30	k star (bias corrected MLE)					1.07	
149	Theta hat (MLE)					0.006	Theta star (bias corrected MLE)					0.007	
150	nu hat (MLE)					36.6	nu star (bias corrected)					30.1	
151	MLE Mean (bias corrected)					0.008	MLE Sd (bias corrected)					0.007	
152													
153	Gamma Kaplan-Meier (KM) Statistics												
154	k hat (KM)					0.78	nu hat (KM)					168	
155	Approximate Chi Square Value (167.99, α)					139	Adjusted Chi Square Value (167.99, β)					138.7	
156	Approximate KM-UCL (use when $n \geq 50$)					0.004	Gamma Adjusted KM-UCL (use when $n < 50$)					0.004	
157													
158	Gamma ROS Statistics using Imputed Non-Detects												
159	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
160	GROS may not be used when kstar of detected data is small such as < 0.1												
161	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
162	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate												
163	Minimum					0.002	Mean					0.009	
164	Maximum					0.039	Median					0.01	
165	SD					0.003	CV					0.38	
166	k hat (MLE)					8.75	k star (bias corrected MLE)					8.51	
167	Theta hat (MLE)					0.001	Theta star (bias corrected MLE)					0.001	
168	nu hat (MLE)					1873	nu star (bias corrected)					1822	
169	MLE Mean (bias corrected)					0.009	MLE Sd (bias corrected)					0.003	
170							Adjusted Level of Significance (β)					0.04	
171	Approximate Chi Square Value (N/A, α)					1724	Adjusted Chi Square Value (N/A, β)					1722	
172	Gamma Approximate UCL (use when $n \geq 50$)					0.016	Gamma Adjusted UCL (use when $n < 50$)					0.016	
173													
174	Lognormal GOF Test on Detected Observations Only												
175	Shapiro Wilk Test Statistic					0.81	Shapiro Wilk GOF Test						
176	5% Shapiro Wilk Critical Value					0.87	Detected Data Not Lognormal at 5% Significance Level						
177	Lilliefors Test Statistic					0.27	Lilliefors GOF Test						
178	5% Lilliefors Critical Value					0.23	Detected Data Not Lognormal at 5% Significance Level						
179	Detected Data Not Lognormal at 5% Significance Level												
180													
181	Lognormal ROS Statistics Using Imputed Non-Detects												
182	Mean in Original Scale					0.003	Mean in Log Scale					-5.98	
183	SD in Original Scale					0.004	SD in Log Scale					0.46	
184	95% t UCL (assumes normality of ROS data)					0.003	95% Percentile Bootstrap UCL					0.003	
185	95% BCA Bootstrap UCL					0.004	95% Bootstrap t UCL					0.005	
186	95% H-UCL (Log ROS)					0.003							
187													
188	DL/2 Statistics												
189	DL/2 Normal						DL/2 Log-Transformed						

	A	B	C	D	E	F	G	H	I	J	K	L
190	Mean in Original Scale					0.003	Mean in Log Scale					-5.75
191	SD in Original Scale					0.004	SD in Log Scale					0.43
192	95% t UCL (Assumes normality)					0.004	95% H-Stat UCL					0.003
193	DL/2 is not a recommended method, provided for comparisons and historical reasons											
194												
195	Nonparametric Distribution Free UCL Statistics											
196	Data do not follow a Discernible Distribution at 5% Significance Level											
197												
198	Suggested UCL to Use											
199	95% KM (t) UCL					0.004	95% KM (% Bootstrap) UCL					0.004
200												
201	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
202	Recommendations are based upon data size, data distribution, and skewness.											
203	mndations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
204	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
205												
206												
207	Aluminum											
208												
209	General Statistics											
210	Total Number of Observations					107	Number of Distinct Observations					102
211							Number of Missing Observations					0
212	Minimum					1680	Mean					5738
213	Maximum					14100	Median					5220
214	SD					2125	Std. Error of Mean					205.4
215	Coefficient of Variation					0.37	Skewness					1.19
216												
217	Normal GOF Test											
218	Shapiro Wilk Test Statistic					0.92	Shapiro Wilk GOF Test					
219	5% Shapiro Wilk P Value					1.4351E	Data Not Normal at 5% Significance Level					
220	Lilliefors Test Statistic					0.11	Lilliefors GOF Test					
221	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level					
222	Data Not Normal at 5% Significance Level											
223												
224	Assuming Normal Distribution											
225	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
226	95% Student's-t UCL					6079	95% Adjusted-CLT UCL (Chen-1995)					6102
227							95% Modified-t UCL (Johnson-1978)					6083
228												
229	Gamma GOF Test											
230	A-D Test Statistic					1.04	Anderson-Darling Gamma GOF Test					
231	5% A-D Critical Value					0.75	Data Not Gamma Distributed at 5% Significance Level					
232	K-S Test Statistic					0.09	Kolmogrov-Smirnoff Gamma GOF Test					
233	5% K-S Critical Value					0.08	Data Not Gamma Distributed at 5% Significance Level					
234	Data Not Gamma Distributed at 5% Significance Level											
235												
236	Gamma Statistics											
237	k hat (MLE)					7.80	k star (bias corrected MLE)					7.59
238	Theta hat (MLE)					735.4	Theta star (bias corrected MLE)					756
239	nu hat (MLE)					1670	nu star (bias corrected)					1624
240	MLE Mean (bias corrected)					5738	MLE Sd (bias corrected)					2083
241							Approximate Chi Square Value (0.05)					1532
242	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					1531
243												
244	Assuming Gamma Distribution											
245	roximate Gamma UCL (use when n>=50))					6085	Adjusted Gamma UCL (use when n<50)					6090
246												
247	Lognormal GOF Test											
248	Shapiro Wilk Test Statistic					0.96	Shapiro Wilk Lognormal GOF Test					
249	5% Shapiro Wilk P Value					0.06	Data appear Lognormal at 5% Significance Level					
250	Lilliefors Test Statistic					0.1	Lilliefors Lognormal GOF Test					
251	5% Lilliefors Critical Value					0.08	Data Not Lognormal at 5% Significance Level					
252	Data appear Approximate Lognormal at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
253												
254	Lognormal Statistics											
255	Minimum of Logged Data					7.42	Mean of logged Data					8.58
256	Maximum of Logged Data					9.55	SD of logged Data					0.37
257												
258	Assuming Lognormal Distribution											
259	95% H-UCL					6131	90% Chebyshev (MVUE) UCL					6386
260	95% Chebyshev (MVUE) UCL					6674	97.5% Chebyshev (MVUE) UCL					7073
261	99% Chebyshev (MVUE) UCL					7858						
262												
263	Nonparametric Distribution Free UCL Statistics											
264	Data appear to follow a Discernible Distribution at 5% Significance Level											
265												
266	Nonparametric Distribution Free UCLs											
267	95% CLT UCL					6076	95% Jackknife UCL					6079
268	95% Standard Bootstrap UCL					6076	95% Bootstrap-t UCL					6105
269	95% Hall's Bootstrap UCL					6121	95% Percentile Bootstrap UCL					6089
270	95% BCA Bootstrap UCL					6095						
271	90% Chebyshev(Mean, Sd) UCL					6355	95% Chebyshev(Mean, Sd) UCL					6634
272	97.5% Chebyshev(Mean, Sd) UCL					7021	99% Chebyshev(Mean, Sd) UCL					7782
273												
274	Suggested UCL to Use											
275	95% Student's-t UCL					6079	or 95% Modified-t UCL					6083
276												
277	tions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
278	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
279	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
280	For additional insight the user may want to consult a statistician.											
281												
282	Americium-241											
283												
284	General Statistics											
285	Total Number of Observations					107	Number of Distinct Observations					101
286	Number of Detects					7	Number of Non-Detects					100
287	Number of Distinct Detects					7	Number of Distinct Non-Detects					95
288	Minimum Detect					0.014	Minimum Non-Detect					-0.003
289	Maximum Detect					0.044	Maximum Non-Detect					0.024
290	Variance Detects					1.1178E	Percent Non-Detects					93.4
291	Mean Detects					0.024	SD Detects					0.014
292	Median Detects					0.024	CV Detects					0.41
293	Skewness Detects					1.48	Kurtosis Detects					2.11
294												
295	Normal GOF Test on Detects Only											
296	Shapiro Wilk Test Statistic					0.83	Shapiro Wilk GOF Test					
297	5% Shapiro Wilk Critical Value					0.80	Detected Data appear Normal at 5% Significance Level					
298	Lilliefors Test Statistic					0.25	Lilliefors GOF Test					
299	5% Lilliefors Critical Value					0.33	Detected Data appear Normal at 5% Significance Level					
300	Detected Data appear Normal at 5% Significance Level											
301												
302	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
303	Mean					-0.001	Standard Error of Mean					8.0562E
304	SD					0.007	95% KM (BCA) UCL					0.001
305	95% KM (t) UCL					-7.181E	95% KM (Percentile Bootstrap) UCL					5.9074E
306	95% KM (z) UCL					-8.350E	95% KM Bootstrap t UCL					-3.690E
307	90% KM Chebyshev UCL					0.001	95% KM Chebyshev UCL					0.002
308	97.5% KM Chebyshev UCL					0.003	99% KM Chebyshev UCL					0.006
309												
310	Gamma GOF Tests on Detected Observations Only											
311	A-D Test Statistic					0.41	Anderson-Darling GOF Test					
312	5% A-D Critical Value					0.70	data appear Gamma Distributed at 5% Significance Level					
313	K-S Test Statistic					0.21	Kolmogrov-Smirnoff GOF					
314	5% K-S Critical Value					0.31	data appear Gamma Distributed at 5% Significance Level					
315	Detected data appear Gamma Distributed at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
316												
317	Gamma Statistics on Detected Data Only											
318	k hat (MLE)				8.19		k star (bias corrected MLE)				4.78	
319	Theta hat (MLE)				0.003		Theta star (bias corrected MLE)				0.005	
320	nu hat (MLE)				114.8		nu star (bias corrected)				66.9	
321	MLE Mean (bias corrected)				0.024		MLE Sd (bias corrected)				0.01	
322												
323	Gamma Kaplan-Meier (KM) Statistics											
324	k hat (KM)				0.03		nu hat (KM)				7.23	
325					Adjusted Level of Significance (β)				0.04			
326	Approximate Chi Square Value (7.24, α)				2.30		Adjusted Chi Square Value (7.24, β)				2.26	
327	Approximate KM-UCL (use when $n \geq 50$)				-0.004		Gamma Adjusted KM-UCL (use when $n < 50$)				-0.004	
328	Gamma (KM) may not be used when k hat (KM) is < 0.1											
329												
330	DL/2 Statistics											
331	Mean in Original Scale				0.004		SD in Original Scale				0.006	
332	95% t UCL (Assumes normality)				0.005							
333	DL/2 is not a recommended method, provided for comparisons and historical reasons											
334												
335	Nonparametric Distribution Free UCL Statistics											
336	Detected Data appear Normal Distributed at 5% Significance Level											
337												
338	Suggested UCL to Use											
339	95% KM (t) UCL				-7.181E		95% KM (Percentile Bootstrap) UCL				5.9074E	
340												
341	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
342	Recommendations are based upon data size, data distribution, and skewness.											
343	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
344	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
345												
346	Anthracene											
347												
348	General Statistics											
349	Total Number of Observations				107		Number of Distinct Observations				100	
350	Number of Detects				30		Number of Non-Detects				77	
351	Number of Distinct Detects				30		Number of Distinct Non-Detects				70	
352	Minimum Detect				0.009		Minimum Non-Detect				0.03	
353	Maximum Detect				5.03		Maximum Non-Detect				1.81	
354	Variance Detects				1.01		Percent Non-Detects				71.9	
355	Mean Detects				0.52		SD Detects				1.00	
356	Median Detects				0.14		CV Detects				1.93	
357	Skewness Detects				3.48		Kurtosis Detects				14.1	
358	Mean of Logged Detects				-1.97		SD of Logged Detects				1.70	
359												
360	Normal GOF Test on Detects Only											
361	Shapiro Wilk Test Statistic				0.55		Shapiro Wilk GOF Test					
362	5% Shapiro Wilk Critical Value				0.92		Detected Data Not Normal at 5% Significance Level					
363	Lilliefors Test Statistic				0.32		Lilliefors GOF Test					
364	5% Lilliefors Critical Value				0.16		Detected Data Not Normal at 5% Significance Level					
365	Detected Data Not Normal at 5% Significance Level											
366												
367	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
368	Mean				0.16		Standard Error of Mean				0.05	
369	SD				0.57		95% KM (BCA) UCL				0.27	
370	95% KM (t) UCL				0.25		95% KM (Percentile Bootstrap) UCL				0.26	
371	95% KM (z) UCL				0.25		95% KM Bootstrap t UCL				0.35	
372	90% KM Chebyshev UCL				0.33		95% KM Chebyshev UCL				0.40	
373	97.5% KM Chebyshev UCL				0.51		99% KM Chebyshev UCL				0.72	
374												
375	Gamma GOF Tests on Detected Observations Only											
376	A-D Test Statistic				1.19		Anderson-Darling GOF Test					
377	5% A-D Critical Value				0.81		Detected Data Not Gamma Distributed at 5% Significance Level					
378	K-S Test Statistic				0.18		Kolmogorov-Smirnov GOF					

	A	B	C	D	E	F	G	H	I	J	K	L	
379	5% K-S Critical Value					0.17	ed Data Not Gamma Distributed at 5% Significance Level						
380	Detected Data Not Gamma Distributed at 5% Significance Level												
381													
382	Gamma Statistics on Detected Data Only												
383	k hat (MLE)					0.48	k star (bias corrected MLE)					0.45	
384	Theta hat (MLE)					1.08	Theta star (bias corrected MLE)					1.14	
385	nu hat (MLE)					28.9	nu star (bias corrected)					27.3	
386	MLE Mean (bias corrected)					0.52	MLE Sd (bias corrected)					0.77	
387													
388	Gamma Kaplan-Meier (KM) Statistics												
389	k hat (KM)					0.08	nu hat (KM)					17.4	
390	Approximate Chi Square Value (17.43, α)					8.98	Adjusted Chi Square Value (17.43, β)					8.89	
391	Approximate KM-UCL (use when $n \geq 50$)					0.31	Gamma Adjusted KM-UCL (use when $n < 50$)					0.31	
392	Gamma (KM) may not be used when k hat (KM) is < 0.1												
393													
394	Gamma ROS Statistics using Imputed Non-Detects												
395	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs												
396	GROS may not be used when kstar of detected data is small such as < 0.1												
397	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
398	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate												
399	Minimum					0.009	Mean					0.15	
400	Maximum					5.03	Median					0.01	
401	SD					0.57	CV					3.75	
402	k hat (MLE)					0.33	k star (bias corrected MLE)					0.33	
403	Theta hat (MLE)					0.45	Theta star (bias corrected MLE)					0.45	
404	nu hat (MLE)					72.5	nu star (bias corrected)					71.8	
405	MLE Mean (bias corrected)					0.15	MLE Sd (bias corrected)					0.26	
406							Adjusted Level of Significance (β)					0.04	
407	Approximate Chi Square Value (71.83, α)					53.3	Adjusted Chi Square Value (71.83, β)					53.1	
408	Gamma Approximate UCL (use when $n \geq 50$)					0.20	Gamma Adjusted UCL (use when $n < 50$)					0.20	
409													
410	Lognormal GOF Test on Detected Observations Only												
411	Shapiro Wilk Test Statistic					0.95	Shapiro Wilk GOF Test						
412	5% Shapiro Wilk Critical Value					0.92	Detected Data appear Lognormal at 5% Significance Level						
413	Lilliefors Test Statistic					0.11	Lilliefors GOF Test						
414	5% Lilliefors Critical Value					0.16	Detected Data appear Lognormal at 5% Significance Level						
415	Detected Data appear Lognormal at 5% Significance Level												
416													
417	Lognormal ROS Statistics Using Imputed Non-Detects												
418	Mean in Original Scale					0.16	Mean in Log Scale					-3.32	
419	SD in Original Scale					0.57	SD in Log Scale					1.24	
420	95% t UCL (assumes normality of ROS data)					0.25	95% Percentile Bootstrap UCL					0.25	
421	95% BCA Bootstrap UCL					0.31	95% Bootstrap t UCL					0.36	
422	95% H-UCL (Log ROS)					0.10							
423													
424	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
425	KM Mean (logged)					-3.34	95% H-UCL (KM -Log)					0.10	
426	KM SD (logged)					1.28	95% Critical H Value (KM-Log)					2.48	
427	KM Standard Error of Mean (logged)					0.15							
428													
429	DL/2 Statistics												
430	DL/2 Normal						DL/2 Log-Transformed						
431	Mean in Original Scale					0.17	Mean in Log Scale					-3.18	
432	SD in Original Scale					0.57	SD in Log Scale					1.27	
433	95% t UCL (Assumes normality)					0.26	95% H-Stat UCL					0.12	
434	DL/2 is not a recommended method, provided for comparisons and historical reasons												
435													
436	Nonparametric Distribution Free UCL Statistics												
437	Detected Data appear Lognormal Distributed at 5% Significance Level												
438													
439	Suggested UCL to Use												
440	95% KM (Chebyshev) UCL					0.40							
441													

	A	B	C	D	E	F	G	H	I	J	K	L	
442	tions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
443	Recommendations are based upon data size, data distribution, and skewness.												
444	mndations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
445	ations results will not cover all Real World data sets; for additional insight the user may want to cons												
446													
447	Aroclor-1254												
448													
449	General Statistics												
450	Total Number of Observations					31	Number of Distinct Observations					30	
451	Number of Detects					19	Number of Non-Detects					12	
452	Number of Distinct Detects					18	Number of Distinct Non-Detects					12	
453	Minimum Detect					0.004	Minimum Non-Detect					0.003	
454	Maximum Detect					1.03	Maximum Non-Detect					0.005	
455	Variance Detects					0.05	Percent Non-Detects					38.7	
456	Mean Detects					0.09	SD Detects					0.23	
457	Median Detects					0.01	CV Detects					2.43	
458	Skewness Detects					4.04	Kurtosis Detects					16.9	
459	Mean of Logged Detects					-3.62	SD of Logged Detects					1.52	
460													
461	Normal GOF Test on Detects Only												
462	Shapiro Wilk Test Statistic					0.40	Shapiro Wilk GOF Test						
463	5% Shapiro Wilk Critical Value					0.90	Detected Data Not Normal at 5% Significance Level						
464	Lilliefors Test Statistic					0.37	Lilliefors GOF Test						
465	5% Lilliefors Critical Value					0.20	Detected Data Not Normal at 5% Significance Level						
466	Detected Data Not Normal at 5% Significance Level												
467													
468	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
469	Mean					0.05	Standard Error of Mean					0.03	
470	SD					0.18	95% KM (BCA) UCL					0.12	
471	95% KM (t) UCL					0.11	95% KM (Percentile Bootstrap) UCL					0.12	
472	95% KM (z) UCL					0.11	95% KM Bootstrap t UCL					0.32	
473	90% KM Chebyshev UCL					0.16	95% KM Chebyshev UCL					0.20	
474	97.5% KM Chebyshev UCL					0.27	99% KM Chebyshev UCL					0.39	
475													
476	Gamma GOF Tests on Detected Observations Only												
477	A-D Test Statistic					1.23	Anderson-Darling GOF Test						
478	5% A-D Critical Value					0.80	ed Data Not Gamma Distributed at 5% Significanc						
479	K-S Test Statistic					0.20	Kolmogrov-Smirnoff GOF						
480	5% K-S Critical Value					0.21	d data appear Gamma Distributed at 5% Significar						
481	Detected data follow Appr. Gamma Distribution at 5% Significance Level												
482													
483	Gamma Statistics on Detected Data Only												
484	k hat (MLE)					0.49	k star (bias corrected MLE)					0.45	
485	Theta hat (MLE)					0.19	Theta star (bias corrected MLE)					0.21	
486	nu hat (MLE)					18.9	nu star (bias corrected)					17.2	
487	MLE Mean (bias corrected)					0.09	MLE Sd (bias corrected)					0.14	
488													
489	Gamma Kaplan-Meier (KM) Statistics												
490	k hat (KM)					0.10	nu hat (KM)					6.67	
491	Approximate Chi Square Value (6.68, α)					1.99	Adjusted Chi Square Value (6.68, β)					1.85	
492	Approximate KM-UCL (use when $n \geq 50$)					0.2	mma Adjusted KM-UCL (use when $n < 50$)					0.21	
493													
494	Gamma ROS Statistics using Imputed Non-Detects												
495	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
496	GROS may not be used when kstar of detected data is small such as < 0.1												
497	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
498	ma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e												
499	Minimum					0.004	Mean					0.06	
500	Maximum					1.03	Median					0.01	
501	SD					0.18	CV					2.96	
502	k hat (MLE)					0.51	k star (bias corrected MLE)					0.48	
503	Theta hat (MLE)					0.12	Theta star (bias corrected MLE)					0.12	
504	nu hat (MLE)					31.9	nu star (bias corrected)					30.1	

	A	B	C	D	E	F	G	H	I	J	K	L
505	MLE Mean (bias corrected)					0.06	MLE Sd (bias corrected)					0.08
506							Adjusted Level of Significance (β)					0.04
507	Approximate Chi Square Value (30.14, α)					18.6	Adjusted Chi Square Value (30.14, β)					18.1
508	Gamma Approximate UCL (use when n>=50)					0.10	Gamma Adjusted UCL (use when n<50)					0.10
509												
510	Lognormal GOF Test on Detected Observations Only											
511	Shapiro Wilk Test Statistic					0.93	Shapiro Wilk GOF Test					
512	5% Shapiro Wilk Critical Value					0.90	Detected Data appear Lognormal at 5% Significance Level					
513	Lilliefors Test Statistic					0.11	Lilliefors GOF Test					
514	5% Lilliefors Critical Value					0.20	Detected Data appear Lognormal at 5% Significance Level					
515	Detected Data appear Lognormal at 5% Significance Level											
516												
517	Lognormal ROS Statistics Using Imputed Non-Detects											
518	Mean in Original Scale					0.05	Mean in Log Scale					-4.99
519	SD in Original Scale					0.18	SD in Log Scale					2.11
520	95% t UCL (assumes normality of ROS data)					0.11	95% Percentile Bootstrap UCL					0.12
521	95% BCA Bootstrap UCL					0.16	95% Bootstrap t UCL					0.29
522	95% H-UCL (Log ROS)					0.29						
523												
524	Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
525	KM Mean (logged)					-4.39	95% H-UCL (KM -Log)					0.09
526	KM SD (logged)					1.51	95% Critical H Value (KM-Log)					3.09
527	KM Standard Error of Mean (logged)					0.27						
528												
529	DL/2 Statistics											
530	DL/2 Normal						DL/2 Log-Transformed					
531	Mean in Original Scale					0.05	Mean in Log Scale					-4.62
532	SD in Original Scale					0.18	SD in Log Scale					1.73
533	95% t UCL (Assumes normality)					0.11	95% H-Stat UCL					0.13
534	DL/2 is not a recommended method, provided for comparisons and historical reasons											
535												
536	Nonparametric Distribution Free UCL Statistics											
537	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
538												
539	Suggested UCL to Use											
540	95% KM (BCA) UCL					0.12	95% GROS Adjusted Gamma UCL					0.10
541	95% Adjusted Gamma KM-UCL					0.21						
542												
543	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
544	Recommendations are based upon data size, data distribution, and skewness.											
545	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
546	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
547												
548	Aroclor-1260											
549												
550	General Statistics											
551	Total Number of Observations					31	Number of Distinct Observations					31
552	Number of Detects					15	Number of Non-Detects					16
553	Number of Distinct Detects					15	Number of Distinct Non-Detects					16
554	Minimum Detect					0.003	Minimum Non-Detect					0.003
555	Maximum Detect					0.61	Maximum Non-Detect					0.005
556	Variance Detects					0.02	Percent Non-Detects					51.6
557	Mean Detects					0.07	SD Detects					0.15
558	Median Detects					0.03	CV Detects					2.04
559	Skewness Detects					3.57	Kurtosis Detects					13.2
560	Mean of Logged Detects					-3.54	SD of Logged Detects					1.32
561												
562	Normal GOF Test on Detects Only											
563	Shapiro Wilk Test Statistic					0.46	Shapiro Wilk GOF Test					
564	5% Shapiro Wilk Critical Value					0.88	Detected Data Not Normal at 5% Significance Level					
565	Lilliefors Test Statistic					0.35	Lilliefors GOF Test					
566	5% Lilliefors Critical Value					0.22	Detected Data Not Normal at 5% Significance Level					
567	Detected Data Not Normal at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
568												
569		Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
570					Mean	0.03				Standard Error of Mean		0.02
571					SD	0.10				95% KM (BCA) UCL		0.07
572					95% KM (t) UCL	0.07				95% KM (Percentile Bootstrap) UCL		0.07
573					95% KM (z) UCL	0.07				95% KM Bootstrap t UCL		0.17
574					90% KM Chebyshev UCL	0.09				95% KM Chebyshev UCL		0.12
575					97.5% KM Chebyshev UCL	0.16				99% KM Chebyshev UCL		0.24
576												
577		Gamma GOF Tests on Detected Observations Only										
578					A-D Test Statistic	0.92				Anderson-Darling GOF Test		
579					5% A-D Critical Value	0.78				Detected Data Not Gamma Distributed at 5% Significance Level		
580					K-S Test Statistic	0.22				Kolmogorov-Smirnov GOF		
581					5% K-S Critical Value	0.23				Detected data appear Gamma Distributed at 5% Significance Level		
582		Detected data follow Appr. Gamma Distribution at 5% Significance Level										
583												
584		Gamma Statistics on Detected Data Only										
585					k hat (MLE)	0.63				k star (bias corrected MLE)		0.55
586					Theta hat (MLE)	0.11				Theta star (bias corrected MLE)		0.13
587					nu hat (MLE)	19.14				nu star (bias corrected)		16.6
588					MLE Mean (bias corrected)	0.07				MLE Sd (bias corrected)		0.10
589												
590		Gamma Kaplan-Meier (KM) Statistics										
591					k hat (KM)	0.12				nu hat (KM)		7.49
592					Approximate Chi Square Value (7.49, α)	2.44				Adjusted Chi Square Value (7.49, β)		2.28
593					Approximate KM-UCL (use when n>=50)	0.11				Gamma Adjusted KM-UCL (use when n<50)		0.12
594												
595		Gamma ROS Statistics using Imputed Non-Detects										
596		GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
597		GROS may not be used when kstar of detected data is small such as < 0.1										
598		For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
599		Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates.										
600					Minimum	0.003				Mean		0.04
601					Maximum	0.61				Median		0.01
602					SD	0.11				CV		2.64
603					k hat (MLE)	0.66				k star (bias corrected MLE)		0.62
604					Theta hat (MLE)	0.06				Theta star (bias corrected MLE)		0.06
605					nu hat (MLE)	41.3				nu star (bias corrected)		38.7
606					MLE Mean (bias corrected)	0.04				MLE Sd (bias corrected)		0.05
607										Adjusted Level of Significance (β)		0.04
608					Approximate Chi Square Value (38.70, α)	25.4				Adjusted Chi Square Value (38.70, β)		24.8
609					Gamma Approximate UCL (use when n>=50)	0.06				Gamma Adjusted UCL (use when n<50)		0.06
610												
611		Lognormal GOF Test on Detected Observations Only										
612					Shapiro Wilk Test Statistic	0.97				Shapiro Wilk GOF Test		
613					5% Shapiro Wilk Critical Value	0.88				Detected Data appear Lognormal at 5% Significance Level		
614					Lilliefors Test Statistic	0.11				Lilliefors GOF Test		
615					5% Lilliefors Critical Value	0.22				Detected Data appear Lognormal at 5% Significance Level		
616		Detected Data appear Lognormal at 5% Significance Level										
617												
618		Lognormal ROS Statistics Using Imputed Non-Detects										
619					Mean in Original Scale	0.03				Mean in Log Scale		-5.00
620					SD in Original Scale	0.11				SD in Log Scale		1.69
621					t UCL (assumes normality of ROS data)	0.07				95% Percentile Bootstrap UCL		0.07
622					95% BCA Bootstrap UCL	0.11				95% Bootstrap t UCL		0.17
623					95% H-UCL (Log ROS)	0.07						
624												
625		DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
626					KM Mean (logged)	-4.69				95% H-UCL (KM -Log)		0.05
627					KM SD (logged)	1.42				95% Critical H Value (KM-Log)		2.97
628					KM Standard Error of Mean (logged)	0.26						
629												
630		DL/2 Statistics										

	A	B	C	D	E	F	G	H	I	J	K	L
631	DL/2 Normal						DL/2 Log-Transformed					
632	Mean in Original Scale					0.03	Mean in Log Scale					-4.90
633	SD in Original Scale					0.11	SD in Log Scale					1.61
634	95% t UCL (Assumes normality)					0.07	95% H-Stat UCL					0.07
635	DL/2 is not a recommended method, provided for comparisons and historical reasons											
636												
637	Nonparametric Distribution Free UCL Statistics											
638	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
639												
640	Suggested UCL to Use											
641	95% KM (t) UCL					0.07	95% GROS Adjusted Gamma UCL					0.06
642	95% Adjusted Gamma KM-UCL					0.12						
643												
644	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
645	Recommendations are based upon data size, data distribution, and skewness.											
646	mmendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
647	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
648												
649	Arsenic											
650												
651	General Statistics											
652	Total Number of Observations					107	Number of Distinct Observations					77
653	Number of Detects					106	Number of Non-Detects					1
654	Number of Distinct Detects					76	Number of Distinct Non-Detects					1
655	Minimum Detect					0.51	Minimum Non-Detect					1.08
656	Maximum Detect					5.81	Maximum Non-Detect					1.08
657	Variance Detects					0.49	Percent Non-Detects					0.93
658	Mean Detects					1.69	SD Detects					0.70
659	Median Detects					1.56	CV Detects					0.41
660	Skewness Detects					2.68	Kurtosis Detects					11.61
661	Mean of Logged Detects					0.46	SD of Logged Detects					0.34
662												
663	Normal GOF Test on Detects Only											
664	Shapiro Wilk Test Statistic					0.80	Normal GOF Test on Detected Observations Only					
665	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
666	Lilliefors Test Statistic					0.19	Lilliefors GOF Test					
667	5% Lilliefors Critical Value					0.08	Detected Data Not Normal at 5% Significance Level					
668	Detected Data Not Normal at 5% Significance Level											
669												
670	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
671	Mean					1.68	Standard Error of Mean					0.06
672	SD					0.70	95% KM (BCA) UCL					1.81
673	95% KM (t) UCL					1.79	95% KM (Percentile Bootstrap) UCL					1.79
674	95% KM (z) UCL					1.79	95% KM Bootstrap t UCL					1.82
675	90% KM Chebyshev UCL					1.89	95% KM Chebyshev UCL					1.98
676	97.5% KM Chebyshev UCL					2.11	99% KM Chebyshev UCL					2.36
677												
678	Gamma GOF Tests on Detected Observations Only											
679	A-D Test Statistic					1.92	Anderson-Darling GOF Test					
680	5% A-D Critical Value					0.75	ed Data Not Gamma Distributed at 5% Significanc					
681	K-S Test Statistic					0.13	Kolmogrov-Smirnoff GOF					
682	5% K-S Critical Value					0.08	ed Data Not Gamma Distributed at 5% Significanc					
683	Detected Data Not Gamma Distributed at 5% Significance Level											
684												
685	Gamma Statistics on Detected Data Only											
686	k hat (MLE)					7.87	k star (bias corrected MLE)					7.65
687	Theta hat (MLE)					0.21	Theta star (bias corrected MLE)					0.22
688	nu hat (MLE)					1670	nu star (bias corrected)					1624
689	MLE Mean (bias corrected)					1.69	MLE Sd (bias corrected)					0.61
690												
691	Gamma Kaplan-Meier (KM) Statistics											
692	k hat (KM)					5.78	nu hat (KM)					1237
693	Approximate Chi Square Value (N/A, α)					1156	Adjusted Chi Square Value (N/A, β)					1155

	A	B	C	D	E	F	G	H	I	J	K	L
694	Approximate KM-UCL (use when n>=50)					1.80mm Adjusted KM-UCL (use when n<50)					1.80	
695												
696	Gamma ROS Statistics using Imputed Non-Detects											
697	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
698	GROS may not be used when kstar of detected data is small such as < 0.1											
699	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
700	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
701	Minimum				0.51	Mean				1.68		
702	Maximum				5.81	Median				1.56		
703	SD				0.70	CV				0.41		
704	k hat (MLE)				7.62	k star (bias corrected MLE)				7.41		
705	Theta hat (MLE)				0.22	Theta star (bias corrected MLE)				0.22		
706	nu hat (MLE)				1632	nu star (bias corrected)				1588		
707	MLE Mean (bias corrected)				1.68	MLE Sd (bias corrected)				0.61		
708						Adjusted Level of Significance (β)				0.04		
709	Approximate Chi Square Value (N/A, α)				1496	Adjusted Chi Square Value (N/A, β)				1495		
710	Gamma Approximate UCL (use when n>=50)					1.78 Gamma Adjusted UCL (use when n<50)					1.78	
711												
712	Lognormal GOF Test on Detected Observations Only											
713	Lilliefors Test Statistic				0.11	Lilliefors GOF Test						
714	5% Lilliefors Critical Value				0.08	Detected Data Not Lognormal at 5% Significance Level						
715	Detected Data appear Approximate Lognormal at 5% Significance Level											
716												
717	Lognormal ROS Statistics Using Imputed Non-Detects											
718	Mean in Original Scale				1.68	Mean in Log Scale				0.45		
719	SD in Original Scale				0.70	SD in Log Scale				0.35		
720	95% t UCL (assumes normality of ROS data)				1.79	95% Percentile Bootstrap UCL				1.80		
721	95% BCA Bootstrap UCL				1.80	95% Bootstrap t UCL				1.82		
722	95% H-UCL (Log ROS)				1.78							
723												
724	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
725	KM Mean (logged)				0.45	95% H-UCL (KM -Log)				1.78		
726	KM SD (logged)				0.35	95% Critical H Value (KM-Log)				1.75		
727	KM Standard Error of Mean (logged)				0.034							
728												
729	DL/2 Statistics											
730	DL/2 Normal					DL/2 Log-Transformed						
731	Mean in Original Scale				1.68	Mean in Log Scale				0.45		
732	SD in Original Scale				0.70	SD in Log Scale				0.36		
733	95% t UCL (Assumes normality)				1.79	95% H-Stat UCL				1.78		
734	DL/2 is not a recommended method, provided for comparisons and historical reasons											
735												
736	Nonparametric Distribution Free UCL Statistics											
737	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
738												
739	Suggested UCL to Use											
740	95% KM (BCA) UCL				1.8							
741												
742	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
743	Recommendations are based upon data size, data distribution, and skewness.											
744	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
745	Singh's results will not cover all Real World data sets; for additional insight the user may want to consult											
746												
747												
748	Barium											
749												
750	General Statistics											
751	Total Number of Observations				107	Number of Distinct Observations				99		
752						Number of Missing Observations				0		
753	Minimum				15.5	Mean				72.34		
754	Maximum				184	Median				66.6		
755	SD				31.68	Std. Error of Mean				3.06		
756	Coefficient of Variation				0.43	Skewness				1.03		

	A	B	C	D	E	F	G	H	I	J	K	L
757												
758						Normal GOF Test						
759				Shapiro Wilk Test Statistic		0.93		Shapiro Wilk GOF Test				
760				5% Shapiro Wilk P Value	3.3237E		Data Not Normal at 5% Significance Level					
761				Lilliefors Test Statistic		0.11		Lilliefors GOF Test				
762				5% Lilliefors Critical Value	0.081		Data Not Normal at 5% Significance Level					
763				Data Not Normal at 5% Significance Level								
764												
765				Assuming Normal Distribution								
766				95% Normal UCL				95% UCLs (Adjusted for Skewness)				
767				95% Student's-t UCL	77.41		95% Adjusted-CLT UCL (Chen-1995)				77.71	
768							95% Modified-t UCL (Johnson-1978)				77.41	
769												
770				Gamma GOF Test								
771				A-D Test Statistic		0.32		Anderson-Darling Gamma GOF Test				
772				5% A-D Critical Value	0.751		<td></td> <td></td> <td></td> <td></td> <td></td>					
773				K-S Test Statistic		0.051		Kolmogrov-Smirnoff Gamma GOF Test				
774				5% K-S Critical Value	0.081		<td></td> <td></td> <td></td> <td></td> <td></td>					
775				Detected data appear Gamma Distributed at 5% Significance Level								
776												
777				Gamma Statistics								
778				k hat (MLE)		5.46		k star (bias corrected MLE)			5.32	
779				Theta hat (MLE)		13.21		Theta star (bias corrected MLE)			13.51	
780				nu hat (MLE)		1170		nu star (bias corrected)			1139	
781				MLE Mean (bias corrected)		72.31		MLE Sd (bias corrected)			31.31	
782								Approximate Chi Square Value (0.05)			1062	
783				Adjusted Level of Significance		0.041		Adjusted Chi Square Value			1061	
784												
785				Assuming Gamma Distribution								
786				Approximate Gamma UCL (use when n>=50)		77.61		Adjusted Gamma UCL (use when n<50)			77.61	
787												
788				Lognormal GOF Test								
789				Shapiro Wilk Test Statistic		0.98		Shapiro Wilk Lognormal GOF Test				
790				5% Shapiro Wilk P Value		0.61	Data appear Lognormal at 5% Significance Level					
791				Lilliefors Test Statistic		0.061		Lilliefors Lognormal GOF Test				
792				5% Lilliefors Critical Value		0.081	Data appear Lognormal at 5% Significance Level					
793				Data appear Lognormal at 5% Significance Level								
794												
795				Lognormal Statistics								
796				Minimum of Logged Data		2.74		Mean of logged Data			4.18	
797				Maximum of Logged Data		5.21		SD of logged Data			0.44	
798												
799				Assuming Lognormal Distribution								
800				95% H-UCL		78.61		90% Chebyshev (MVUE) UCL			82.51	
801				95% Chebyshev (MVUE) UCL		86.91		97.5% Chebyshev (MVUE) UCL			93.11	
802				99% Chebyshev (MVUE) UCL		105.31						
803												
804				Nonparametric Distribution Free UCL Statistics								
805				Data appear to follow a Discernible Distribution at 5% Significance Level								
806												
807				Nonparametric Distribution Free UCLs								
808				95% CLT UCL		77.31		95% Jackknife UCL			77.41	
809				95% Standard Bootstrap UCL		77.31		95% Bootstrap-t UCL			77.61	
810				95% Hall's Bootstrap UCL		77.71		95% Percentile Bootstrap UCL			77.51	
811				95% BCA Bootstrap UCL		77.71						
812				90% Chebyshev(Mean, Sd) UCL		81.51		95% Chebyshev(Mean, Sd) UCL			85.71	
813				97.5% Chebyshev(Mean, Sd) UCL		91.41		99% Chebyshev(Mean, Sd) UCL			102.81	
814												
815				Suggested UCL to Use								
816				95% Approximate Gamma UCL		77.61						
817												
818				Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate								
819				Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and								

	A	B	C	D	E	F	G	H	I	J	K	L	
820	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets												
821	For additional insight the user may want to consult a statistician.												
822													
823	Benzo(a)anthracene												
824													
825	General Statistics												
826	Total Number of Observations					107	Number of Distinct Observations					100	
827	Number of Detects					49	Number of Non-Detects					58	
828	Number of Distinct Detects					48	Number of Distinct Non-Detects					54	
829	Minimum Detect					0.013	Minimum Non-Detect					0.033	
830	Maximum Detect					11.4	Maximum Non-Detect					1.81	
831	Variance Detects					4.40	Percent Non-Detects					54.2	
832	Mean Detects					0.99	SD Detects					2.1	
833	Median Detects					0.079	CV Detects					2.10	
834	Skewness Detects					3.28	Kurtosis Detects					12.64	
835	Mean of Logged Detects					-1.85	SD of Logged Detects					1.97	
836													
837	Normal GOF Test on Detects Only												
838	Shapiro Wilk Test Statistic					0.54	Shapiro Wilk GOF Test						
839	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Normal at 5% Significance Level						
840	Lilliefors Test Statistic					0.33	Lilliefors GOF Test						
841	5% Lilliefors Critical Value					0.12	Detected Data Not Normal at 5% Significance Level						
842	Detected Data Not Normal at 5% Significance Level												
843													
844	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
845	Mean					0.47	Standard Error of Mean					0.14	
846	SD					1.48	95% KM (BCA) UCL					0.75	
847	95% KM (t) UCL					0.71	95% KM (Percentile Bootstrap) UCL					0.71	
848	95% KM (z) UCL					0.71	95% KM Bootstrap t UCL					0.87	
849	90% KM Chebyshev UCL					0.90	95% KM Chebyshev UCL					1.10	
850	97.5% KM Chebyshev UCL					1.37	99% KM Chebyshev UCL					1.91	
851													
852	Gamma GOF Tests on Detected Observations Only												
853	A-D Test Statistic					3.31	Anderson-Darling GOF Test						
854	5% A-D Critical Value					0.84	Detected Data Not Gamma Distributed at 5% Significance Level						
855	K-S Test Statistic					0.21	Kolmogrov-Smirnoff GOF						
856	5% K-S Critical Value					0.13	Detected Data Not Gamma Distributed at 5% Significance Level						
857	Detected Data Not Gamma Distributed at 5% Significance Level												
858													
859	Gamma Statistics on Detected Data Only												
860	k hat (MLE)					0.36	k star (bias corrected MLE)					0.35	
861	Theta hat (MLE)					2.75	Theta star (bias corrected MLE)					2.82	
862	nu hat (MLE)					35.46	nu star (bias corrected)					34.61	
863	MLE Mean (bias corrected)					0.99	MLE Sd (bias corrected)					1.67	
864													
865	Gamma Kaplan-Meier (KM) Statistics												
866	k hat (KM)					0.1	nu hat (KM)					21.43	
867	Approximate Chi Square Value (21.43, α)					11.9	Adjusted Chi Square Value (21.43, β)					11.8	
868	Approximate KM-UCL (use when n>=50)					0.84	Gamma Adjusted KM-UCL (use when n<50)					0.85	
869													
870	Gamma ROS Statistics using Imputed Non-Detects												
871	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
872	GROS may not be used when kstar of detected data is small such as < 0.1												
873	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
874	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
875	Minimum					0.01	Mean					0.46	
876	Maximum					11.4	Median					0.01	
877	SD					1.49	CV					3.23	
878	k hat (MLE)					0.27	k star (bias corrected MLE)					0.27	
879	Theta hat (MLE)					1.69	Theta star (bias corrected MLE)					1.70	
880	nu hat (MLE)					58.21	nu star (bias corrected)					57.94	
881	MLE Mean (bias corrected)					0.46	MLE Sd (bias corrected)					0.88	
882							Adjusted Level of Significance (β)					0.04	

	A	B	C	D	E	F	G	H	I	J	K	L
883	Approximate Chi Square Value (57.98, α)					41.48	Adjusted Chi Square Value (57.98, β)					41.27
884	Gamma Approximate UCL (use when $n \geq 50$)					0.64	Gamma Adjusted UCL (use when $n < 50$)					0.64
885												
886	Lognormal GOF Test on Detected Observations Only											
887	Shapiro Wilk Test Statistic					0.89	Shapiro Wilk GOF Test					
888	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Lognormal at 5% Significance Level					
889	Lilliefors Test Statistic					0.14	Lilliefors GOF Test					
890	5% Lilliefors Critical Value					0.12	Detected Data Not Lognormal at 5% Significance Level					
891	Detected Data Not Lognormal at 5% Significance Level											
892												
893	Lognormal ROS Statistics Using Imputed Non-Detects											
894	Mean in Original Scale					0.47	Mean in Log Scale					-2.87
895	SD in Original Scale					1.49	SD in Log Scale					1.64
896	95% t UCL (assumes normality of ROS data)					0.71	95% Percentile Bootstrap UCL					0.70
897	95% BCA Bootstrap UCL					0.81	95% Bootstrap t UCL					0.83
898	95% H-UCL (Log ROS)					0.34						
899												
900	DL/2 Statistics											
901	DL/2 Normal						DL/2 Log-Transformed					
902	Mean in Original Scale					0.48	Mean in Log Scale					-2.81
903	SD in Original Scale					1.49	SD in Log Scale					1.67
904	95% t UCL (Assumes normality)					0.72	95% H-Stat UCL					0.39
905	DL/2 is not a recommended method, provided for comparisons and historical reasons											
906												
907	Nonparametric Distribution Free UCL Statistics											
908	Data do not follow a Discernible Distribution at 5% Significance Level											
909												
910	Suggested UCL to Use											
911	95% KM (Chebyshev) UCL					1.10						
912												
913	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
914	Recommendations are based upon data size, data distribution, and skewness.											
915	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
916	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
917												
918	Benzo(a)pyrene											
919												
920	General Statistics											
921	Total Number of Observations					107	Number of Distinct Observations					101
922	Number of Detects					45	Number of Non-Detects					62
923	Number of Distinct Detects					45	Number of Distinct Non-Detects					56
924	Minimum Detect					0.013	Minimum Non-Detect					0.033
925	Maximum Detect					10.1	Maximum Non-Detect					0.40
926	Variance Detects					4.30	Percent Non-Detects					57.9%
927	Mean Detects					1.07	SD Detects					2.07
928	Median Detects					0.11	CV Detects					1.93
929	Skewness Detects					2.82	Kurtosis Detects					8.54
930	Mean of Logged Detects					-1.62	SD of Logged Detects					1.95
931												
932	Normal GOF Test on Detects Only											
933	Shapiro Wilk Test Statistic					0.58	Shapiro Wilk GOF Test					
934	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Normal at 5% Significance Level					
935	Lilliefors Test Statistic					0.30	Lilliefors GOF Test					
936	5% Lilliefors Critical Value					0.13	Detected Data Not Normal at 5% Significance Level					
937	Detected Data Not Normal at 5% Significance Level											
938												
939	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
940	Mean					0.46	Standard Error of Mean					0.14
941	SD					1.42	95% KM (BCA) UCL					0.69
942	95% KM (t) UCL					0.69	95% KM (Percentile Bootstrap) UCL					0.69
943	95% KM (z) UCL					0.69	95% KM Bootstrap t UCL					0.85
944	90% KM Chebyshev UCL					0.88	95% KM Chebyshev UCL					1.07
945	97.5% KM Chebyshev UCL					1.33	99% KM Chebyshev UCL					1.85

	A	B	C	D	E	F	G	H	I	J	K	L
946												
947	Gamma GOF Tests on Detected Observations Only											
948	A-D Test Statistic				2.41	Anderson-Darling GOF Test						
949	5% A-D Critical Value				0.84	Detected Data Not Gamma Distributed at 5% Significance Level						
950	K-S Test Statistic				0.20	Kolmogorov-Smirnov GOF						
951	5% K-S Critical Value				0.14	Detected Data Not Gamma Distributed at 5% Significance Level						
952	Detected Data Not Gamma Distributed at 5% Significance Level											
953												
954	Gamma Statistics on Detected Data Only											
955	k hat (MLE)				0.38	k star (bias corrected MLE)						0.37
956	Theta hat (MLE)				2.76	Theta star (bias corrected MLE)						2.84
957	nu hat (MLE)				35	nu star (bias corrected)						34
958	MLE Mean (bias corrected)				1.07	MLE Sd (bias corrected)						1.74
959												
960	Gamma Kaplan-Meier (KM) Statistics											
961	k hat (KM)				0.10	nu hat (KM)						22.8
962	Approximate Chi Square Value (22.84, α)				12.9	Adjusted Chi Square Value (22.84, β)				12.8		
963	Approximate KM-UCL (use when $n \geq 50$)				0.82	Gamma Adjusted KM-UCL (use when $n < 50$)				0.82		
964												
965	Gamma ROS Statistics using Imputed Non-Detects											
966	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
967	GROS may not be used when kstar of detected data is small such as < 0.1											
968	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
969	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
970	Minimum				0.01	Mean						0.45
971	Maximum				10.1	Median						0.01
972	SD				1.43	CV						3.13
973	k hat (MLE)				0.27	k star (bias corrected MLE)						0.27
974	Theta hat (MLE)				1.68	Theta star (bias corrected MLE)						1.68
975	nu hat (MLE)				58.2	nu star (bias corrected)						57.9
976	MLE Mean (bias corrected)				0.45	MLE Sd (bias corrected)						0.87
977						Adjusted Level of Significance (β)						0.04
978	Approximate Chi Square Value (57.99, α)				41.4	Adjusted Chi Square Value (57.99, β)				41.2		
979	Gamma Approximate UCL (use when $n \geq 50$)				0.64	Gamma Adjusted UCL (use when $n < 50$)				0.64		
980												
981	Lognormal GOF Test on Detected Observations Only											
982	Shapiro Wilk Test Statistic				0.91	Shapiro Wilk GOF Test						
983	5% Shapiro Wilk Critical Value				0.94	Detected Data Not Lognormal at 5% Significance Level						
984	Lilliefors Test Statistic				0.13	Lilliefors GOF Test						
985	5% Lilliefors Critical Value				0.13	Detected Data Not Lognormal at 5% Significance Level						
986	Detected Data Not Lognormal at 5% Significance Level											
987												
988	Lognormal ROS Statistics Using Imputed Non-Detects											
989	Mean in Original Scale				0.46	Mean in Log Scale						-2.89
990	SD in Original Scale				1.43	SD in Log Scale						1.67
991	95% t UCL (assumes normality of ROS data)				0.69	95% Percentile Bootstrap UCL						0.69
992	95% BCA Bootstrap UCL				0.75	95% Bootstrap t UCL						0.79
993	95% H-UCL (Log ROS)				0.36							
994												
995	DL/2 Statistics											
996	DL/2 Normal					DL/2 Log-Transformed						
997	Mean in Original Scale				0.46	Mean in Log Scale						-2.83
998	SD in Original Scale				1.43	SD in Log Scale						1.66
999	95% t UCL (Assumes normality)				0.69	95% H-Stat UCL						0.37
1000	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1001												
1002	Nonparametric Distribution Free UCL Statistics											
1003	Data do not follow a Discernible Distribution at 5% Significance Level											
1004												
1005	Suggested UCL to Use											
1006	95% KM (Chebyshev) UCL				1.07							
1007												
1008	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											

	A	B	C	D	E	F	G	H	I	J	K	L
1009	Recommendations are based upon data size, data distribution, and skewness.											
1010	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1011	Recommendations results will not cover all Real World data sets; for additional insight the user may want to cons											
1012												
1013	Benzo(b)fluoranthene											
1014												
1015	General Statistics											
1016	Total Number of Observations				107	Number of Distinct Observations				102		
1017	Number of Detects				50	Number of Non-Detects				57		
1018	Number of Distinct Detects				50	Number of Distinct Non-Detects				53		
1019	Minimum Detect				0.014	Minimum Non-Detect				0.033		
1020	Maximum Detect				19.6	Maximum Non-Detect				0.40		
1021	Variance Detects				17.8	Percent Non-Detects				53.2		
1022	Mean Detects				1.94	SD Detects				4.22		
1023	Median Detects				0.15	CV Detects				2.16		
1024	Skewness Detects				3.10	Kurtosis Detects				9.71		
1025	Mean of Logged Detects				-1.32	SD of Logged Detects				2.11		
1026												
1027	Normal GOF Test on Detects Only											
1028	Shapiro Wilk Test Statistic				0.51	Shapiro Wilk GOF Test						
1029	5% Shapiro Wilk Critical Value				0.94	Detected Data Not Normal at 5% Significance Level						
1030	Lilliefors Test Statistic				0.32	Lilliefors GOF Test						
1031	5% Lilliefors Critical Value				0.12	Detected Data Not Normal at 5% Significance Level						
1032	Detected Data Not Normal at 5% Significance Level											
1033												
1034	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1035	Mean				0.92	Standard Error of Mean				0.29		
1036	SD				3.01	95% KM (BCA) UCL				1.45		
1037	95% KM (t) UCL				1.41	95% KM (Percentile Bootstrap) UCL				1.40		
1038	95% KM (z) UCL				1.40	95% KM Bootstrap t UCL				1.68		
1039	90% KM Chebyshev UCL				1.80	95% KM Chebyshev UCL				2.20		
1040	97.5% KM Chebyshev UCL				2.76	99% KM Chebyshev UCL				3.85		
1041												
1042	Gamma GOF Tests on Detected Observations Only											
1043	A-D Test Statistic				2.84	Anderson-Darling GOF Test						
1044	5% A-D Critical Value				0.85	Detected Data Not Gamma Distributed at 5% Significance Level						
1045	K-S Test Statistic				0.20	Kolmogorov-Smirnov GOF						
1046	5% K-S Critical Value				0.13	Detected Data Not Gamma Distributed at 5% Significance Level						
1047	Detected Data Not Gamma Distributed at 5% Significance Level											
1048												
1049	Gamma Statistics on Detected Data Only											
1050	k hat (MLE)				0.34	k star (bias corrected MLE)				0.33		
1051	Theta hat (MLE)				5.72	Theta star (bias corrected MLE)				5.84		
1052	nu hat (MLE)				33.9	nu star (bias corrected)				33.2		
1053	MLE Mean (bias corrected)				1.94	MLE Sd (bias corrected)				3.37		
1054												
1055	Gamma Kaplan-Meier (KM) Statistics											
1056	k hat (KM)				0.09	nu hat (KM)				20.1		
1057	Approximate Chi Square Value (20.12, α)				10.9	Adjusted Chi Square Value (20.12, β)				10.8		
1058	Approximate KM-UCL (use when $n \geq 50$)				1.69	Gamma Adjusted KM-UCL (use when $n < 50$)				1.71		
1059	Gamma (KM) may not be used when k hat (KM) is < 0.1											
1060												
1061	Gamma ROS Statistics using Imputed Non-Detects											
1062	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
1063	GROS may not be used when kstar of detected data is small such as < 0.1											
1064	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1065	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
1066	Minimum				0.01	Mean				0.91		
1067	Maximum				19.6	Median				0.01		
1068	SD				3.02	CV				3.31		
1069	k hat (MLE)				0.24	k star (bias corrected MLE)				0.23		
1070	Theta hat (MLE)				3.81	Theta star (bias corrected MLE)				3.82		
1071	nu hat (MLE)				51.3	nu star (bias corrected)				51.2		

	A	B	C	D	E	F	G	H	I	J	K	L
1072	MLE Mean (bias corrected)					0.91	MLE Sd (bias corrected)					1.87
1073							Adjusted Level of Significance (β)					0.04
1074	Approximate Chi Square Value (51.21, α)					35.7	Adjusted Chi Lognormal Value (51.21, β)					35.6
1075	Gamma Approximate UCL (use when n>=50)					1.30	Gamma Adjusted UCL (use when n<50)					1.31
1076												
1077	Lognormal GOF Test on Detected Observations Only											
1078	Shapiro Wilk Test Statistic					0.91	Shapiro Wilk GOF Test					
1079	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Lognormal at 5% Significance Level					
1080	Lilliefors Test Statistic					0.12	Lilliefors GOF Test					
1081	5% Lilliefors Critical Value					0.12	Detected Data appear Lognormal at 5% Significance Level					
1082	Detected Data appear Approximate Lognormal at 5% Significance Level											
1083												
1084	Lognormal ROS Statistics Using Imputed Non-Detects											
1085	Mean in Original Scale					0.92	Mean in Log Scale					-2.63
1086	SD in Original Scale					3.02	SD in Log Scale					1.90
1087	95% t UCL (assumes normality of ROS data)					1.40	95% Percentile Bootstrap UCL					1.41
1088	95% BCA Bootstrap UCL					1.59	95% Bootstrap t UCL					1.73
1089	95% H-UCL (Log ROS)					0.79						
1090												
1091	Tests using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1092	KM Mean (logged)					-2.57	95% H-UCL (KM -Log)					0.76
1093	KM SD (logged)					1.86	95% Critical H Value (KM-Log)					3.14
1094	KM Standard Error of Mean (logged)					0.18						
1095												
1096	DL/2 Statistics											
1097	DL/2 Normal						DL/2 Log-Transformed					
1098	Mean in Original Scale					0.92	Mean in Log Scale					-2.59
1099	SD in Original Scale					3.02	SD in Log Scale					1.9
1100	95% t UCL (Assumes normality)					1.41	95% H-Stat UCL					0.82
1101	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1102												
1103	Nonparametric Distribution Free UCL Statistics											
1104	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1105												
1106	Suggested UCL to Use											
1107	97.5% KM (Chebyshev) UCL					2.76						
1108												
1109	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1110	Recommendations are based upon data size, data distribution, and skewness.											
1111	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1112	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
1113												
1114	Benzo(g,h,i)perylene											
1115												
1116	General Statistics											
1117	Total Number of Observations					107	Number of Distinct Observations					99
1118	Number of Detects					35	Number of Non-Detects					72
1119	Number of Distinct Detects					35	Number of Distinct Non-Detects					66
1120	Minimum Detect					0.016	Minimum Non-Detect					0.03
1121	Maximum Detect					4.88	Maximum Non-Detect					1.81
1122	Variance Detects					1.22	Percent Non-Detects					67.2
1123	Mean Detects					0.68	SD Detects					1.10
1124	Median Detects					0.13	CV Detects					1.60
1125	Skewness Detects					2.32	Kurtosis Detects					5.60
1126	Mean of Logged Detects					-1.61	SD of Logged Detects					1.67
1127												
1128	Normal GOF Test on Detects Only											
1129	Shapiro Wilk Test Statistic					0.65	Shapiro Wilk GOF Test					
1130	5% Shapiro Wilk Critical Value					0.93	Detected Data Not Normal at 5% Significance Level					
1131	Lilliefors Test Statistic					0.27	Lilliefors GOF Test					
1132	5% Lilliefors Critical Value					0.15	Detected Data Not Normal at 5% Significance Level					
1133	Detected Data Not Normal at 5% Significance Level											
1134												

	A	B	C	D	E	F	G	H	I	J	K	L
1135	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1136	Mean				0.24	Standard Error of Mean				0.06		
1137	SD				0.69	95% KM (BCA) UCL				0.36		
1138	95% KM (t) UCL				0.35	95% KM (Percentile Bootstrap) UCL				0.36		
1139	95% KM (z) UCL				0.35	95% KM Bootstrap t UCL				0.41		
1140	90% KM Chebyshev UCL				0.44	95% KM Chebyshev UCL				0.54		
1141	97.5% KM Chebyshev UCL				0.67	99% KM Chebyshev UCL				0.92		
1142												
1143	Gamma GOF Tests on Detected Observations Only											
1144	A-D Test Statistic				1.45	Anderson-Darling GOF Test						
1145	5% A-D Critical Value				0.81	Detected Data Not Gamma Distributed at 5% Significance Level						
1146	K-S Test Statistic				0.21	Kolmogorov-Smirnov GOF						
1147	5% K-S Critical Value				0.15	Detected Data Not Gamma Distributed at 5% Significance Level						
1148	Detected Data Not Gamma Distributed at 5% Significance Level											
1149												
1150	Gamma Statistics on Detected Data Only											
1151	k hat (MLE)				0.51	k star (bias corrected MLE)				0.48		
1152	Theta hat (MLE)				1.35	Theta star (bias corrected MLE)				1.42		
1153	nu hat (MLE)				35.7	nu star (bias corrected)				33.9		
1154	MLE Mean (bias corrected)				0.68	MLE Sd (bias corrected)				0.98		
1155												
1156	Gamma Kaplan-Meier (KM) Statistics											
1157	k hat (KM)				0.12	nu hat (KM)				26.1		
1158	Approximate Chi Square Value (26.10, α)				15.41	Adjusted Chi Square Value (26.10, β)				15.31		
1159	Approximate KM-UCL (use when $n \geq 50$)				0.41	Gamma Adjusted KM-UCL (use when $n < 50$)				0.41		
1160												
1161	Gamma ROS Statistics using Imputed Non-Detects											
1162	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1163	GROS may not be used when kstar of detected data is small such as < 0.1											
1164	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1165	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1166	Minimum				0.01	Mean				0.23		
1167	Maximum				4.88	Median				0.01		
1168	SD				0.70	CV				3.03		
1169	k hat (MLE)				0.31	k star (bias corrected MLE)				0.31		
1170	Theta hat (MLE)				0.73	Theta star (bias corrected MLE)				0.74		
1171	nu hat (MLE)				67.5	nu star (bias corrected)				66.9		
1172	MLE Mean (bias corrected)				0.23	MLE Sd (bias corrected)				0.41		
1173						Adjusted Level of Significance (β)				0.04		
1174	Approximate Chi Square Value (66.99, α)				49.15	Adjusted Chi Square Value (66.99, β)				48.91		
1175	Gamma Approximate UCL (use when $n \geq 50$)				0.31	Gamma Adjusted UCL (use when $n < 50$)				0.31		
1176												
1177	Lognormal GOF Test on Detected Observations Only											
1178	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test						
1179	5% Shapiro Wilk Critical Value				0.93	Detected Data Not Lognormal at 5% Significance Level						
1180	Lilliefors Test Statistic				0.12	Lilliefors GOF Test						
1181	5% Lilliefors Critical Value				0.15	Detected Data appear Lognormal at 5% Significance Level						
1182	Detected Data appear Approximate Lognormal at 5% Significance Level											
1183												
1184	Lognormal ROS Statistics Using Imputed Non-Detects											
1185	Mean in Original Scale				0.23	Mean in Log Scale				-3.22		
1186	SD in Original Scale				0.70	SD in Log Scale				1.49		
1187	95% t UCL (assumes normality of ROS data)				0.35	95% Percentile Bootstrap UCL				0.36		
1188	95% BCA Bootstrap UCL				0.38	95% Bootstrap t UCL				0.41		
1189	95% H-UCL (Log ROS)				0.18							
1190												
1191	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1192	KM Mean (logged)				-3.01	95% H-UCL (KM -Log)				0.18		
1193	KM SD (logged)				1.38	95% Critical H Value (KM-Log)				2.59		
1194	KM Standard Error of Mean (logged)				0.15							
1195												
1196	DL/2 Statistics											
1197	DL/2 Normal						DL/2 Log-Transformed					

	A	B	C	D	E	F	G	H	I	J	K	L
1198	Mean in Original Scale					0.25	Mean in Log Scale					-2.98
1199	SD in Original Scale					0.70	SD in Log Scale					1.44
1200	95% t UCL (Assumes normality)					0.36	95% H-Stat UCL					0.20
1201	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1202												
1203	Nonparametric Distribution Free UCL Statistics											
1204	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1205												
1206	Suggested UCL to Use											
1207	95% KM (Chebyshev) UCL					0.54						
1208												
1209	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1210	Recommendations are based upon data size, data distribution, and skewness.											
1211	mndations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1212	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
1213												
1214	Benzoic Acid											
1215												
1216	General Statistics											
1217	Total Number of Observations					107	Number of Distinct Observations					98
1218	Number of Detects					13	Number of Non-Detects					94
1219	Number of Distinct Detects					13	Number of Distinct Non-Detects					85
1220	Minimum Detect					0.24	Minimum Non-Detect					0.70
1221	Maximum Detect					1.65	Maximum Non-Detect					36.3
1222	Variance Detects					0.17	Percent Non-Detects					87.8%
1223	Mean Detects					0.69	SD Detects					0.42
1224	Median Detects					0.60	CV Detects					0.60
1225	Skewness Detects					1.75	Kurtosis Detects					2.33
1226	Mean of Logged Detects					-0.49	SD of Logged Detects					0.51
1227												
1228	Normal GOF Test on Detects Only											
1229	Shapiro Wilk Test Statistic					0.72	Shapiro Wilk GOF Test					
1230	5% Shapiro Wilk Critical Value					0.86	Detected Data Not Normal at 5% Significance Level					
1231	Lilliefors Test Statistic					0.34	Lilliefors GOF Test					
1232	5% Lilliefors Critical Value					0.24	Detected Data Not Normal at 5% Significance Level					
1233	Detected Data Not Normal at 5% Significance Level											
1234												
1235	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1236	Mean					0.55	Standard Error of Mean					0.04
1237	SD					0.20	95% KM (BCA) UCL					0.62
1238	95% KM (t) UCL					0.63	95% KM (Percentile Bootstrap) UCL					0.62
1239	95% KM (z) UCL					0.62	95% KM Bootstrap t UCL					0.62
1240	90% KM Chebyshev UCL					0.68	95% KM Chebyshev UCL					0.74
1241	97.5% KM Chebyshev UCL					0.82	99% KM Chebyshev UCL					0.98
1242												
1243	Gamma GOF Tests on Detected Observations Only											
1244	A-D Test Statistic					1.07	Anderson-Darling GOF Test					
1245	5% A-D Critical Value					0.73	ed Data Not Gamma Distributed at 5% Significanc					
1246	K-S Test Statistic					0.28	Kolmogorov-Smirnov GOF					
1247	5% K-S Critical Value					0.23	ed Data Not Gamma Distributed at 5% Significanc					
1248	Detected Data Not Gamma Distributed at 5% Significance Level											
1249												
1250	Gamma Statistics on Detected Data Only											
1251	k hat (MLE)					3.94	k star (bias corrected MLE)					3.08
1252	Theta hat (MLE)					0.17	Theta star (bias corrected MLE)					0.22
1253	nu hat (MLE)					102.5	nu star (bias corrected)					80.2
1254	MLE Mean (bias corrected)					0.69	MLE Sd (bias corrected)					0.39
1255												
1256	Gamma Kaplan-Meier (KM) Statistics											
1257	k hat (KM)					7.54	nu hat (KM)					1614
1258	Approximate Chi Square Value (N/A, α)					1522	Adjusted Chi Square Value (N/A, β)					1521
1259	Approximate KM-UCL (use when n>=50)					0.59	mma Adjusted KM-UCL (use when n<50)					0.59
1260												

	A	B	C	D	E	F	G	H	I	J	K	L	
1261	Gamma ROS Statistics using Imputed Non-Detects												
1262	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1263	GROS may not be used when kstar of detected data is small such as < 0.1												
1264	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1265	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1266	Minimum				0.24	Mean				0.55			
1267	Maximum				1.65	Median				0.53			
1268	SD				0.15	CV				0.28			
1269	k hat (MLE)				20.8	k star (bias corrected MLE)				20.2			
1270	Theta hat (MLE)				0.02	Theta star (bias corrected MLE)				0.02			
1271	nu hat (MLE)				4466	nu star (bias corrected)				4342			
1272	MLE Mean (bias corrected)				0.55	MLE Sd (bias corrected)				0.12			
1273						Adjusted Level of Significance (β)				0.04			
1274	Approximate Chi Square Value (N/A, α)				4190	Adjusted Chi Square Value (N/A, β)				4188			
1275	Gamma Approximate UCL (use when n>=50)				0.57	Gamma Adjusted UCL (use when n<50)				0.57			
1276													
1277	Lognormal GOF Test on Detected Observations Only												
1278	Shapiro Wilk Test Statistic				0.88	Shapiro Wilk GOF Test							
1279	5% Shapiro Wilk Critical Value				0.86	Detected Data appear Lognormal at 5% Significance Level							
1280	Lilliefors Test Statistic				0.25	Lilliefors GOF Test							
1281	5% Lilliefors Critical Value				0.24	Detected Data Not Lognormal at 5% Significance Level							
1282	Detected Data appear Approximate Lognormal at 5% Significance Level												
1283													
1284	Lognormal ROS Statistics Using Imputed Non-Detects												
1285	Mean in Original Scale				0.55	Mean in Log Scale				-0.62			
1286	SD in Original Scale				0.15	SD in Log Scale				0.19			
1287	95% t UCL (assumes normality of ROS data)				0.57	95% Percentile Bootstrap UCL				0.57			
1288	95% BCA Bootstrap UCL				0.59	95% Bootstrap t UCL				0.60			
1289	95% H-UCL (Log ROS)				0.56								
1290													
1291	Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
1292	KM Mean (logged)				-0.64	95% H-UCL (KM -Log)				0.59			
1293	KM SD (logged)				0.33	95% Critical H Value (KM-Log)				1.75			
1294	KM Standard Error of Mean (logged)				0.09								
1295													
1296	DL/2 Statistics												
1297	DL/2 Normal					DL/2 Log-Transformed							
1298	Mean in Original Scale				0.81	Mean in Log Scale				-0.56			
1299	SD in Original Scale				1.77	SD in Log Scale				0.62			
1300	95% t UCL (Assumes normality)				1.10	95% H-Stat UCL				0.77			
1301	DL/2 is not a recommended method, provided for comparisons and historical reasons												
1302													
1303	Nonparametric Distribution Free UCL Statistics												
1304	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level												
1305													
1306	Suggested UCL to Use												
1307	95% KM (t) UCL				0.63	95% KM (% Bootstrap) UCL				0.62			
1308													
1309	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
1310	Recommendations are based upon data size, data distribution, and skewness.												
1311	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
1312	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												
1313													
1314	Beryllium												
1315													
1316	General Statistics												
1317	Total Number of Observations				107	Number of Distinct Observations				93			
1318	Number of Detects				106	Number of Non-Detects				1			
1319	Number of Distinct Detects				92	Number of Distinct Non-Detects				1			
1320	Minimum Detect				0.15	Minimum Non-Detect				0.10			
1321	Maximum Detect				2.44	Maximum Non-Detect				0.10			
1322	Variance Detects				0.06	Percent Non-Detects				0.93			
1323	Mean Detects				0.61	SD Detects				0.25			

	A	B	C	D	E	F	G	H	I	J	K	L
1324	Median Detects					0.57	CV Detects					0.40
1325	Skewness Detects					3.81	Kurtosis Detects					26.14
1326	Mean of Logged Detects					-0.55	SD of Logged Detects					0.34
1327												
1328	Normal GOF Test on Detects Only											
1329	Shapiro Wilk Test Statistic					0.76	Normal GOF Test on Detected Observations Only					
1330	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
1331	Lilliefors Test Statistic					0.13	Lilliefors GOF Test					
1332	5% Lilliefors Critical Value					0.08	Detected Data Not Normal at 5% Significance Level					
1333	Detected Data Not Normal at 5% Significance Level											
1334												
1335	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1336	Mean					0.60	Standard Error of Mean					0.02
1337	SD					0.25	95% KM (BCA) UCL					0.65
1338	95% KM (t) UCL					0.64	95% KM (Percentile Bootstrap) UCL					0.64
1339	95% KM (z) UCL					0.64	95% KM Bootstrap t UCL					0.65
1340	90% KM Chebyshev UCL					0.68	95% KM Chebyshev UCL					0.71
1341	97.5% KM Chebyshev UCL					0.76	99% KM Chebyshev UCL					0.85
1342												
1343	Gamma GOF Tests on Detected Observations Only											
1344	A-D Test Statistic					1.36	Anderson-Darling GOF Test					
1345	5% A-D Critical Value					0.75	Detected Data Not Gamma Distributed at 5% Significance Level					
1346	K-S Test Statistic					0.09	Kolmogorov-Smirnov GOF					
1347	5% K-S Critical Value					0.08	Detected Data Not Gamma Distributed at 5% Significance Level					
1348	Detected Data Not Gamma Distributed at 5% Significance Level											
1349												
1350	Gamma Statistics on Detected Data Only											
1351	k hat (MLE)					8.31	k star (bias corrected MLE)					8.08
1352	Theta hat (MLE)					0.07	Theta star (bias corrected MLE)					0.07
1353	nu hat (MLE)					1763	nu star (bias corrected)					1715
1354	MLE Mean (bias corrected)					0.61	MLE Sd (bias corrected)					0.21
1355												
1356	Gamma Kaplan-Meier (KM) Statistics											
1357	k hat (KM)					5.77	nu hat (KM)					1237
1358	Approximate Chi Square Value (N/A, α)					1156	Adjusted Chi Square Value (N/A, β)					1155
1359	Approximate KM-UCL (use when $n \geq 50$)					0.65	Gamma Adjusted KM-UCL (use when $n < 50$)					0.65
1360												
1361	Gamma ROS Statistics using Imputed Non-Detects											
1362	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1363	GROS may not be used when kstar of detected data is small such as < 0.1											
1364	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1365	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
1366	Minimum					0.15	Mean					0.60
1367	Maximum					2.44	Median					0.56
1368	SD					0.25	CV					0.41
1369	k hat (MLE)					7.71	k star (bias corrected MLE)					7.50
1370	Theta hat (MLE)					0.07	Theta star (bias corrected MLE)					0.08
1371	nu hat (MLE)					1651	nu star (bias corrected)					1606
1372	MLE Mean (bias corrected)					0.60	MLE Sd (bias corrected)					0.22
1373							Adjusted Level of Significance (β)					0.04
1374	Approximate Chi Square Value (N/A, α)					1514	Adjusted Chi Square Value (N/A, β)					1512
1375	Gamma Approximate UCL (use when $n \geq 50$)					0.64	Gamma Adjusted UCL (use when $n < 50$)					0.64
1376												
1377	Lognormal GOF Test on Detected Observations Only											
1378	Lilliefors Test Statistic					0.09	Lilliefors GOF Test					
1379	5% Lilliefors Critical Value					0.08	Detected Data Not Lognormal at 5% Significance Level					
1380	Detected Data appear Approximate Lognormal at 5% Significance Level											
1381												
1382	Lognormal ROS Statistics Using Imputed Non-Detects											
1383	Mean in Original Scale					0.61	Mean in Log Scale					-0.55
1384	SD in Original Scale					0.25	SD in Log Scale					0.35
1385	95% t UCL (assumes normality of ROS data)					0.65	95% Percentile Bootstrap UCL					0.65
1386	95% BCA Bootstrap UCL					0.66	95% Bootstrap t UCL					0.66

	A	B	C	D	E	F	G	H	I	J	K	L
1387	95% H-UCL (Log ROS)					0.64						
1388												
1389	Tests using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1390	KM Mean (logged)					-0.56	95% H-UCL (KM -Log)					0.65
1391	KM SD (logged)					0.37	95% Critical H Value (KM-Log)					1.76
1392	KM Standard Error of Mean (logged)					0.03						
1393												
1394	DL/2 Statistics											
1395	DL/2 Normal					DL/2 Log-Transformed						
1396	Mean in Original Scale					0.60	Mean in Log Scale					-0.57
1397	SD in Original Scale					0.25	SD in Log Scale					0.41
1398	95% t UCL (Assumes normality)					0.64	95% H-Stat UCL					0.66
1399	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1400												
1401	Nonparametric Distribution Free UCL Statistics											
1402	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
1403												
1404	Suggested UCL to Use											
1405	95% KM (BCA) UCL					0.65						
1406												
1407	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1408	Recommendations are based upon data size, data distribution, and skewness.											
1409	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1410	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consider											
1411												
1412	Bis(2-ethylhexyl)phthalate											
1413												
1414	General Statistics											
1415	Total Number of Observations					107	Number of Distinct Observations					93
1416	Number of Detects					5	Number of Non-Detects					102
1417	Number of Distinct Detects					5	Number of Distinct Non-Detects					89
1418	Minimum Detect					0.11	Minimum Non-Detect					0.35
1419	Maximum Detect					0.60	Maximum Non-Detect					18.1
1420	Variance Detects					0.04	Percent Non-Detects					95.3
1421	Mean Detects					0.31	SD Detects					0.20
1422	Median Detects					0.23	CV Detects					0.65
1423	Skewness Detects					0.78	Kurtosis Detects					-1.06
1424	Mean of Logged Detects					-1.34	SD of Logged Detects					0.67
1425												
1426	Normal GOF Test on Detects Only											
1427	Shapiro Wilk Test Statistic					0.91	Shapiro Wilk GOF Test					
1428	5% Shapiro Wilk Critical Value					0.76	Detected Data appear Normal at 5% Significance Level					
1429	Lilliefors Test Statistic					0.25	Lilliefors GOF Test					
1430	5% Lilliefors Critical Value					0.39	Detected Data appear Normal at 5% Significance Level					
1431	Detected Data appear Normal at 5% Significance Level											
1432												
1433	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
1434	Mean					0.18	Standard Error of Mean					0.03
1435	SD					0.07	95% KM (BCA) UCL					0.35
1436	95% KM (t) UCL					0.23	95% KM (Percentile Bootstrap) UCL					0.25
1437	95% KM (z) UCL					0.23	95% KM Bootstrap t UCL					0.29
1438	90% KM Chebyshev UCL					0.27	95% KM Chebyshev UCL					0.32
1439	97.5% KM Chebyshev UCL					0.38	99% KM Chebyshev UCL					0.49
1440												
1441	Gamma GOF Tests on Detected Observations Only											
1442	A-D Test Statistic					0.25	Anderson-Darling GOF Test					
1443	5% A-D Critical Value					0.68	Detected data appear Gamma Distributed at 5% Significance Level					
1444	K-S Test Statistic					0.21	Kolmogorov-Smirnov GOF					
1445	5% K-S Critical Value					0.35	Detected data appear Gamma Distributed at 5% Significance Level					
1446	Detected data appear Gamma Distributed at 5% Significance Level											
1447												
1448	Gamma Statistics on Detected Data Only											
1449	k hat (MLE)					2.95	k star (bias corrected MLE)					1.31

	A	B	C	D	E	F	G	H	I	J	K	L
1450	Theta hat (MLE)				0.10	Theta star (bias corrected MLE)				0.23		
1451	nu hat (MLE)				29.5	nu star (bias corrected)				13.1		
1452	MLE Mean (bias corrected)				0.31	MLE Sd (bias corrected)				0.27		
1453												
1454	Gamma Kaplan-Meier (KM) Statistics											
1455	k hat (KM)				5.98	nu hat (KM)				1282		
1456	Approximate Chi Square Value (N/A, α)				1200	Adjusted Chi Square Value (N/A, β)				1198		
1457	Approximate KM-UCL (use when $n \geq 50$)				0.19	Gamma Adjusted KM-UCL (use when $n < 50$)				0.19		
1458												
1459	Gamma ROS Statistics using Imputed Non-Detects											
1460	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
1461	GROS may not be used when kstar of detected data is small such as < 0.1											
1462	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
1463	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
1464	Minimum				0.10	Mean				0.17		
1465	Maximum				0.60	Median				0.16		
1466	SD				0.05	CV				0.31		
1467	k hat (MLE)				18.7	k star (bias corrected MLE)				18.1		
1468	Theta hat (MLE)				0.009	Theta star (bias corrected MLE)				0.009		
1469	nu hat (MLE)				4003	nu star (bias corrected)				3892		
1470	MLE Mean (bias corrected)				0.17	MLE Sd (bias corrected)				0.04		
1471						Adjusted Level of Significance (β)				0.04		
1472	Approximate Chi Square Value (N/A, α)				3748	Adjusted Chi Square Value (N/A, β)				3746		
1473	Gamma Approximate UCL (use when $n \geq 50$)				0.18	Gamma Adjusted UCL (use when $n < 50$)				0.18		
1474												
1475	Lognormal GOF Test on Detected Observations Only											
1476	Shapiro Wilk Test Statistic				0.96	Shapiro Wilk GOF Test						
1477	5% Shapiro Wilk Critical Value				0.76	Detected Data appear Lognormal at 5% Significance Level						
1478	Lilliefors Test Statistic				0.17	Lilliefors GOF Test						
1479	5% Lilliefors Critical Value				0.39	Detected Data appear Lognormal at 5% Significance Level						
1480	Detected Data appear Lognormal at 5% Significance Level											
1481												
1482	Lognormal ROS Statistics Using Imputed Non-Detects											
1483	Mean in Original Scale				0.17	Mean in Log Scale				-1.77		
1484	SD in Original Scale				0.05	SD in Log Scale				0.19		
1485	95% t UCL (assumes normality of ROS data)				0.18	95% Percentile Bootstrap UCL				0.18		
1486	95% BCA Bootstrap UCL				0.18	95% Bootstrap t UCL				0.19		
1487	95% H-UCL (Log ROS)				0.17							
1488												
1489	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
1490	KM Mean (logged)				-1.76	95% H-UCL (KM -Log)				0.19		
1491	KM SD (logged)				0.34	95% Critical H Value (KM-Log)				1.75		
1492	KM Standard Error of Mean (logged)				0.18							
1493												
1494	DL/2 Statistics											
1495	DL/2 Normal					DL/2 Log-Transformed						
1496	Mean in Original Scale				0.39	Mean in Log Scale				-1.30		
1497	SD in Original Scale				0.88	SD in Log Scale				0.60		
1498	95% t UCL (Assumes normality)				0.53	95% H-Stat UCL				0.36		
1499	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1500												
1501	Nonparametric Distribution Free UCL Statistics											
1502	Detected Data appear Normal Distributed at 5% Significance Level											
1503												
1504	Suggested UCL to Use											
1505	95% KM (t) UCL				0.23	95% KM (Percentile Bootstrap) UCL				0.25		
1506												
1507	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1508	Recommendations are based upon data size, data distribution, and skewness.											
1509	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1510	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
1511												
1512	Cadmium											

	A	B	C	D	E	F	G	H	I	J	K	L	
1513													
1514	General Statistics												
1515	Total Number of Observations				107	Number of Distinct Observations				96			
1516	Number of Detects				36	Number of Non-Detects				71			
1517	Number of Distinct Detects				35	Number of Distinct Non-Detects				61			
1518	Minimum Detect				0.10	Minimum Non-Detect				0.18			
1519	Maximum Detect				3.35	Maximum Non-Detect				0.88			
1520	Variance Detects				0.36	Percent Non-Detects				66.3			
1521	Mean Detects				0.51	SD Detects				0.60			
1522	Median Detects				0.31	CV Detects				1.17			
1523	Skewness Detects				3.31	Kurtosis Detects				13.7			
1524	Mean of Logged Detects				-1.04	SD of Logged Detects				0.81			
1525													
1526	Normal GOF Test on Detects Only												
1527	Shapiro Wilk Test Statistic				0.62	Shapiro Wilk GOF Test							
1528	5% Shapiro Wilk Critical Value				0.93	Detected Data Not Normal at 5% Significance Level							
1529	Lilliefors Test Statistic				0.25	Lilliefors GOF Test							
1530	5% Lilliefors Critical Value				0.14	Detected Data Not Normal at 5% Significance Level							
1531	Detected Data Not Normal at 5% Significance Level												
1532													
1533	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1534	Mean				0.33	Standard Error of Mean				0.03			
1535	SD				0.37	95% KM (BCA) UCL				0.40			
1536	95% KM (t) UCL				0.39	95% KM (Percentile Bootstrap) UCL				0.39			
1537	95% KM (z) UCL				0.39	95% KM Bootstrap t UCL				0.42			
1538	90% KM Chebyshev UCL				0.45	95% KM Chebyshev UCL				0.50			
1539	97.5% KM Chebyshev UCL				0.57	99% KM Chebyshev UCL				0.72			
1540													
1541	Gamma GOF Tests on Detected Observations Only												
1542	A-D Test Statistic				1.61	Anderson-Darling GOF Test							
1543	5% A-D Critical Value				0.76	Detected Data Not Gamma Distributed at 5% Significance Level							
1544	K-S Test Statistic				0.15	Kolmogorov-Smirnoff GOF							
1545	5% K-S Critical Value				0.15	Detected Data Not Gamma Distributed at 5% Significance Level							
1546	Detected Data Not Gamma Distributed at 5% Significance Level												
1547													
1548	Gamma Statistics on Detected Data Only												
1549	k hat (MLE)				1.45	k star (bias corrected MLE)				1.34			
1550	Theta hat (MLE)				0.35	Theta star (bias corrected MLE)				0.38			
1551	nu hat (MLE)				104.5	nu star (bias corrected)				97.1			
1552	MLE Mean (bias corrected)				0.51	MLE Sd (bias corrected)				0.44			
1553													
1554	Gamma Kaplan-Meier (KM) Statistics												
1555	k hat (KM)				0.76	nu hat (KM)				162.9			
1556	Approximate Chi Square Value (162.92, α)				134.4	Adjusted Chi Square Value (162.92, β)				134.1			
1557	Approximate KM-UCL (use when n>=50)				0.40	Gamma Adjusted KM-UCL (use when n<50)				0.40			
1558													
1559	Gamma ROS Statistics using Imputed Non-Detects												
1560	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1561	GROS may not be used when kstar of detected data is small such as < 0.1												
1562	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1563	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
1564	Minimum				0.01	Mean				0.28			
1565	Maximum				3.35	Median				0.17			
1566	SD				0.39	CV				1.38			
1567	k hat (MLE)				1.41	k star (bias corrected MLE)				1.38			
1568	Theta hat (MLE)				0.19	Theta star (bias corrected MLE)				0.20			
1569	nu hat (MLE)				302.7	nu star (bias corrected)				295.5			
1570	MLE Mean (bias corrected)				0.28	MLE Sd (bias corrected)				0.24			
1571						Adjusted Level of Significance (β)				0.04			
1572	Approximate Chi Square Value (295.51, α)				256.7	Adjusted Chi Square Value (295.51, β)				256.2			
1573	Gamma Approximate UCL (use when n>=50)				0.32	Gamma Adjusted UCL (use when n<50)				0.32			
1574													
1575	Lognormal GOF Test on Detected Observations Only												

A	B	C	D	E	F	G	H	I	J	K	L
1576	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test					
1577	5% Shapiro Wilk Critical Value				0.93	Detected Data appear Lognormal at 5% Significance Level					
1578	Lilliefors Test Statistic				0.13	Lilliefors GOF Test					
1579	5% Lilliefors Critical Value				0.14	Detected Data appear Lognormal at 5% Significance Level					
1580	Detected Data appear Lognormal at 5% Significance Level										
1581											
1582	Lognormal ROS Statistics Using Imputed Non-Detects										
1583	Mean in Original Scale				0.32	Mean in Log Scale				-1.32	
1584	SD in Original Scale				0.37	SD in Log Scale				0.52	
1585	95% t UCL (assumes normality of ROS data)				0.38	95% Percentile Bootstrap UCL				0.39	
1586	95% BCA Bootstrap UCL				0.41	95% Bootstrap t UCL				0.43	
1587	95% H-UCL (Log ROS)				0.33						
1588											
1589	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
1590	KM Mean (logged)				-1.36	95% H-UCL (KM -Log)				0.34	
1591	KM SD (logged)				0.61	95% Critical H Value (KM-Log)				1.90	
1592	KM Standard Error of Mean (logged)				0.08						
1593											
1594	DL/2 Statistics										
1595	DL/2 Normal					DL/2 Log-Transformed					
1596	Mean in Original Scale				0.36	Mean in Log Scale				-1.21	
1597	SD in Original Scale				0.36	SD in Log Scale				0.53	
1598	95% t UCL (Assumes normality)				0.42	95% H-Stat UCL				0.37	
1599	DL/2 is not a recommended method, provided for comparisons and historical reasons										
1600											
1601	Nonparametric Distribution Free UCL Statistics										
1602	Detected Data appear Lognormal Distributed at 5% Significance Level										
1603											
1604	Suggested UCL to Use										
1605	95% KM (t) UCL				0.39	95% KM (% Bootstrap) UCL				0.39	
1606											
1607	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1608	Recommendations are based upon data size, data distribution, and skewness.										
1609	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
1610	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult										
1611											
1612											
1613	Calcium										
1614											
1615	General Statistics										
1616	Total Number of Observations				107	Number of Distinct Observations				95	
1617						Number of Missing Observations				0	
1618	Minimum				298	Mean				2847	
1619	Maximum				11700	Median				2570	
1620	SD				1617	Std. Error of Mean				156.4	
1621	Coefficient of Variation				0.56	Skewness				2.17	
1622											
1623	Normal GOF Test										
1624	Shapiro Wilk Test Statistic				0.86	Shapiro Wilk GOF Test					
1625	5% Shapiro Wilk P Value				4.996E-	Data Not Normal at 5% Significance Level					
1626	Lilliefors Test Statistic				0.13	Lilliefors GOF Test					
1627	5% Lilliefors Critical Value				0.08	Data Not Normal at 5% Significance Level					
1628	Data Not Normal at 5% Significance Level										
1629											
1630	Assuming Normal Distribution										
1631	95% Normal UCL					95% UCLs (Adjusted for Skewness)					
1632	95% Student's-t UCL				3106	95% Adjusted-CLT UCL (Chen-1995)				3139	
1633						95% Modified-t UCL (Johnson-1978)				3112	
1634											
1635	Gamma GOF Test										
1636	A-D Test Statistic				0.52	Anderson-Darling Gamma GOF Test					
1637	5% A-D Critical Value				0.75	Data appear Gamma Distributed at 5% Significance Level					
1638	K-S Test Statistic				0.07	Kolmogorov-Smirnov Gamma GOF Test					

A	B	C	D	E	F	G	H	I	J	K	L
1639	5% K-S Critical Value				0.084	If data appear Gamma Distributed at 5% Significance Level					
1640	Detected data appear Gamma Distributed at 5% Significance Level										
1641											
1642	Gamma Statistics										
1643	k hat (MLE)				3.68	k star (bias corrected MLE)				3.58	
1644	Theta hat (MLE)				773.1	Theta star (bias corrected MLE)				794	
1645	nu hat (MLE)				788	nu star (bias corrected)				767.3	
1646	MLE Mean (bias corrected)				2847	MLE Sd (bias corrected)				1503	
1647						Approximate Chi Square Value (0.05)				704	
1648	Adjusted Level of Significance				0.04	Adjusted Chi Square Value				703.2	
1649											
1650	Assuming Gamma Distribution										
1651	Approximate Gamma UCL (use when n>=50)				3103	Adjusted Gamma UCL (use when n<50)				3106	
1652											
1653	Lognormal GOF Test										
1654	Shapiro Wilk Test Statistic				0.97	Shapiro Wilk Lognormal GOF Test					
1655	5% Shapiro Wilk P Value				0.46	Data appear Lognormal at 5% Significance Level					
1656	Lilliefors Test Statistic				0.07	Lilliefors Lognormal GOF Test					
1657	5% Lilliefors Critical Value				0.084	Data appear Lognormal at 5% Significance Level					
1658	Data appear Lognormal at 5% Significance Level										
1659											
1660	Lognormal Statistics										
1661	Minimum of Logged Data				5.69	Mean of logged Data				7.81	
1662	Maximum of Logged Data				9.36	SD of logged Data				0.55	
1663											
1664	Assuming Lognormal Distribution										
1665	95% H-UCL				3181	90% Chebyshev (MVUE) UCL				3365	
1666	95% Chebyshev (MVUE) UCL				3588	97.5% Chebyshev (MVUE) UCL				3898	
1667	99% Chebyshev (MVUE) UCL				4505						
1668											
1669	Nonparametric Distribution Free UCL Statistics										
1670	Data appear to follow a Discernible Distribution at 5% Significance Level										
1671											
1672	Nonparametric Distribution Free UCLs										
1673	95% CLT UCL				3104	95% Jackknife UCL				3106	
1674	95% Standard Bootstrap UCL				3102	95% Bootstrap-t UCL				3137	
1675	95% Hall's Bootstrap UCL				3163	95% Percentile Bootstrap UCL				3111	
1676	95% BCA Bootstrap UCL				3145						
1677	90% Chebyshev(Mean, Sd) UCL				3316	95% Chebyshev(Mean, Sd) UCL				3528	
1678	97.5% Chebyshev(Mean, Sd) UCL				3823	99% Chebyshev(Mean, Sd) UCL				4403	
1679											
1680	Suggested UCL to Use										
1681	95% Approximate Gamma UCL				3103						
1682											
1683	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1684	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh and Singh (2003). However, simulations results will not cover all Real World data sets										
1685	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets										
1686	For additional insight the user may want to consult a statistician.										
1687											
1688	Cesium-137										
1689											
1690	General Statistics										
1691	Total Number of Observations				104	Number of Distinct Observations				101	
1692	Number of Detects				85	Number of Non-Detects				19	
1693	Number of Distinct Detects				82	Number of Distinct Non-Detects				19	
1694	Minimum Detect				0.07	Minimum Non-Detect				-0.049	
1695	Maximum Detect				3.31	Maximum Non-Detect				0.082	
1696	Variance Detects				0.21	Percent Non-Detects				18.2	
1697	Mean Detects				0.58	SD Detects				0.46	
1698	Median Detects				0.52	CV Detects				0.78	
1699	Skewness Detects				2.93	Kurtosis Detects				14.0	
1700											
1701	Normal GOF Test on Detects Only										

A	B	C	D	E	F	G	H	I	J	K	L
1702	Shapiro Wilk Test Statistic				0.78	Normal GOF Test on Detected Observations Only					
1703	5% Shapiro Wilk P Value				0	Detected Data Not Normal at 5% Significance Level					
1704	Lilliefors Test Statistic				0.17	Lilliefors GOF Test					
1705	5% Lilliefors Critical Value				0.09	Detected Data Not Normal at 5% Significance Level					
1706	Detected Data Not Normal at 5% Significance Level										
1707											
1708	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
1709	Mean				0.47	Standard Error of Mean				0.04	
1710	SD				0.48	95% KM (BCA) UCL				0.55	
1711	95% KM (t) UCL				0.55	95% KM (Percentile Bootstrap) UCL				0.55	
1712	95% KM (z) UCL				0.54	95% KM Bootstrap t UCL				0.56	
1713	90% KM Chebyshev UCL				0.61	95% KM Chebyshev UCL				0.67	
1714	97.5% KM Chebyshev UCL				0.76	99% KM Chebyshev UCL				0.94	
1715											
1716	Gamma GOF Tests on Detected Observations Only										
1717	A-D Test Statistic				0.55	Anderson-Darling GOF Test					
1718	5% A-D Critical Value				0.76	data appear Gamma Distributed at 5% Significance Level					
1719	K-S Test Statistic				0.08	Kolmogrov-Smirnoff GOF					
1720	5% K-S Critical Value				0.09	data appear Gamma Distributed at 5% Significance Level					
1721	Detected data appear Gamma Distributed at 5% Significance Level										
1722											
1723	Gamma Statistics on Detected Data Only										
1724	k hat (MLE)				2.13	k star (bias corrected MLE)				2.06	
1725	Theta hat (MLE)				0.27	Theta star (bias corrected MLE)				0.28	
1726	nu hat (MLE)				362.8	nu star (bias corrected)				351.4	
1727	MLE Mean (bias corrected)				0.58	MLE Sd (bias corrected)				0.40	
1728											
1729	Gamma Kaplan-Meier (KM) Statistics										
1730	k hat (KM)				0.95	nu hat (KM)				197.8	
1731						Adjusted Level of Significance (β)				0.04	
1732	Approximate Chi Square Value (197.80, α)				166.3	Adjusted Chi Square Value (197.80, β)				165.9	
1733	Approximate KM-UCL (use when $n \geq 50$)				0.56	Gamma Adjusted KM-UCL (use when $n < 50$)				0.56	
1734											
1735	DL/2 Statistics										
1736	Mean in Original Scale				0.48	SD in Original Scale				0.47	
1737	95% t UCL (Assumes normality)				0.55						
1738	DL/2 is not a recommended method, provided for comparisons and historical reasons										
1739											
1740	Nonparametric Distribution Free UCL Statistics										
1741	Detected Data appear Gamma Distributed at 5% Significance Level										
1742											
1743	Suggested UCL to Use										
1744	95% KM (BCA) UCL				0.55	95% GROS Approximate Gamma UCL				N/A	
1745	95% Approximate Gamma KM-UCL				0.56						
1746	Warning: One or more Recommended UCL(s) not available!										
1747											
1748	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate										
1749	Recommendations are based upon data size, data distribution, and skewness.										
1750	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and										
1751	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult										
1752											
1753											
1754	Chromium										
1755											
1756	General Statistics										
1757	Total Number of Observations				107	Number of Distinct Observations				98	
1758						Number of Missing Observations				0	
1759	Minimum				4.07	Mean				18.9	
1760	Maximum				192	Median				10.8	
1761	SD				26.74	Std. Error of Mean				2.58	
1762	Coefficient of Variation				1.40	Skewness				3.98	
1763											
1764	Normal GOF Test										

	A	B	C	D	E	F	G	H	I	J	K	L	
1765	Shapiro Wilk Test Statistic					0.50	Shapiro Wilk GOF Test						
1766	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level						
1767	Lilliefors Test Statistic					0.31	Lilliefors GOF Test						
1768	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level						
1769	Data Not Normal at 5% Significance Level												
1770													
1771	Assuming Normal Distribution												
1772	95% Normal UCL						95% UCLs (Adjusted for Skewness)						
1773	95% Student's-t UCL					23.2	95% Adjusted-CLT UCL (Chen-1995)					24.3	
1774							95% Modified-t UCL (Johnson-1978)					23.4	
1775													
1776	Gamma GOF Test												
1777	A-D Test Statistic					8.90	Anderson-Darling Gamma GOF Test						
1778	5% A-D Critical Value					0.77	Data Not Gamma Distributed at 5% Significance Level						
1779	K-S Test Statistic					0.21	Kolmogrov-Smirnoff Gamma GOF Test						
1780	5% K-S Critical Value					0.08	Data Not Gamma Distributed at 5% Significance Level						
1781	Data Not Gamma Distributed at 5% Significance Level												
1782													
1783	Gamma Statistics												
1784	k hat (MLE)					1.38	k star (bias corrected MLE)					1.35	
1785	Theta hat (MLE)					13.7	Theta star (bias corrected MLE)					14.0	
1786	nu hat (MLE)					296.5	nu star (bias corrected)					289.5	
1787	MLE Mean (bias corrected)					18.9	MLE Sd (bias corrected)					16.3	
1788							Approximate Chi Square Value (0.05)					251.1	
1789	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					250.6	
1790													
1791	Assuming Gamma Distribution												
1792	Approximate Gamma UCL (use when n>=50)					21.8	Adjusted Gamma UCL (use when n<50)					21.9	
1793													
1794	Lognormal GOF Test												
1795	Shapiro Wilk Test Statistic					0.87	Shapiro Wilk Lognormal GOF Test						
1796	5% Shapiro Wilk P Value					1.85	Data Not Lognormal at 5% Significance Level						
1797	Lilliefors Test Statistic					0.14	Lilliefors Lognormal GOF Test						
1798	5% Lilliefors Critical Value					0.08	Data Not Lognormal at 5% Significance Level						
1799	Data Not Lognormal at 5% Significance Level												
1800													
1801	Lognormal Statistics												
1802	Minimum of Logged Data					1.40	Mean of logged Data					2.54	
1803	Maximum of Logged Data					5.25	SD of logged Data					0.75	
1804													
1805	Assuming Lognormal Distribution												
1806	95% H-UCL					19.5	90% Chebyshev (MVUE) UCL					20.9	
1807	95% Chebyshev (MVUE) UCL					22.8	97.5% Chebyshev (MVUE) UCL					25.4	
1808	99% Chebyshev (MVUE) UCL					30.5							
1809													
1810	Nonparametric Distribution Free UCL Statistics												
1811	Data do not follow a Discernible Distribution (0.05)												
1812													
1813	Nonparametric Distribution Free UCLs												
1814	95% CLT UCL					23.2	95% Jackknife UCL					23.2	
1815	95% Standard Bootstrap UCL					23.2	95% Bootstrap-t UCL					24.8	
1816	95% Hall's Bootstrap UCL					25.2	95% Percentile Bootstrap UCL					23.5	
1817	95% BCA Bootstrap UCL					24.2							
1818	90% Chebyshev(Mean, Sd) UCL					26.7	95% Chebyshev(Mean, Sd) UCL					30.2	
1819	97.5% Chebyshev(Mean, Sd) UCL					35.1	99% Chebyshev(Mean, Sd) UCL					44.7	
1820													
1821	Suggested UCL to Use												
1822	95% Chebyshev (Mean, Sd) UCL					30.2							
1823													
1824	Conditions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
1825	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and												
1826	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets												
1827	For additional insight the user may want to consult a statistician.												

	A	B	C	D	E	F	G	H	I	J	K	L	
1828													
1829	Chrysene												
1830													
1831	General Statistics												
1832	Total Number of Observations					107	Number of Distinct Observations					103	
1833	Number of Detects					51	Number of Non-Detects					56	
1834	Number of Distinct Detects					50	Number of Distinct Non-Detects					53	
1835	Minimum Detect					0.01	Minimum Non-Detect					0.03	
1836	Maximum Detect					12.3	Maximum Non-Detect					0.40	
1837	Variance Detects					5.02	Percent Non-Detects					52.3	
1838	Mean Detects					1.05	SD Detects					2.24	
1839	Median Detects					0.09	CV Detects					2.11	
1840	Skewness Detects					3.33	Kurtosis Detects					12.9	
1841	Mean of Logged Detects					-1.75	SD of Logged Detects					1.95	
1842													
1843	Normal GOF Test on Detects Only												
1844	Shapiro Wilk Test Statistic					0.53	Normal GOF Test on Detected Observations Only						
1845	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level						
1846	Lilliefors Test Statistic					0.32	Lilliefors GOF Test						
1847	5% Lilliefors Critical Value					0.12	Detected Data Not Normal at 5% Significance Level						
1848	Detected Data Not Normal at 5% Significance Level												
1849													
1850	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
1851	Mean					0.51	Standard Error of Mean					0.15	
1852	SD					1.61	95% KM (BCA) UCL					0.83	
1853	95% KM (t) UCL					0.78	95% KM (Percentile Bootstrap) UCL					0.79	
1854	95% KM (z) UCL					0.77	95% KM Bootstrap t UCL					0.96	
1855	90% KM Chebyshev UCL					0.99	95% KM Chebyshev UCL					1.20	
1856	97.5% KM Chebyshev UCL					1.50	99% KM Chebyshev UCL					2.09	
1857													
1858	Gamma GOF Tests on Detected Observations Only												
1859	A-D Test Statistic					3.30	Anderson-Darling GOF Test						
1860	5% A-D Critical Value					0.84	Detected Data Not Gamma Distributed at 5% Significance Level						
1861	K-S Test Statistic					0.21	Kolmogrov-Smirnoff GOF						
1862	5% K-S Critical Value					0.13	Detected Data Not Gamma Distributed at 5% Significance Level						
1863	Detected Data Not Gamma Distributed at 5% Significance Level												
1864													
1865	Gamma Statistics on Detected Data Only												
1866	k hat (MLE)					0.36	k star (bias corrected MLE)					0.36	
1867	Theta hat (MLE)					2.87	Theta star (bias corrected MLE)					2.94	
1868	nu hat (MLE)					37.5	nu star (bias corrected)					36.7	
1869	MLE Mean (bias corrected)					1.05	MLE Sd (bias corrected)					1.76	
1870													
1871	Gamma Kaplan-Meier (KM) Statistics												
1872	k hat (KM)					0.10	nu hat (KM)					22.0	
1873	Approximate Chi Square Value (22.02, α)					12.3	Adjusted Chi Square Value (22.02, β)					12.2	
1874	Approximate KM-UCL (use when $n \geq 50$)					0.92	Gamma Adjusted KM-UCL (use when $n < 50$)					0.93	
1875													
1876	Gamma ROS Statistics using Imputed Non-Detects												
1877	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
1878	GROS may not be used when kstar of detected data is small such as < 0.1												
1879	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
1880	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate												
1881	Minimum					0.01	Mean					0.51	
1882	Maximum					12.3	Median					0.01	
1883	SD					1.62	CV					3.19	
1884	k hat (MLE)					0.27	k star (bias corrected MLE)					0.27	
1885	Theta hat (MLE)					1.87	Theta star (bias corrected MLE)					1.88	
1886	nu hat (MLE)					58.2	nu star (bias corrected)					57.9	
1887	MLE Mean (bias corrected)					0.51	MLE Sd (bias corrected)					0.98	
1888							Adjusted Level of Significance (β)					0.04	
1889	Approximate Chi Square Value (57.98, α)					41.4	Adjusted Chi Square Value (57.98, β)					41.2	
1890	Gamma Approximate UCL (use when $n \geq 50$)					0.71	Gamma Adjusted UCL (use when $n < 50$)					0.71	

	A	B	C	D	E	F	G	H	I	J	K	L
1891												
1892	Lognormal GOF Test on Detected Observations Only											
1893	Lilliefors Test Statistic				0.13		Lilliefors GOF Test					
1894	5% Lilliefors Critical Value				0.12		Detected Data Not Lognormal at 5% Significance Level					
1895	Detected Data Not Lognormal at 5% Significance Level											
1896												
1897	Lognormal ROS Statistics Using Imputed Non-Detects											
1898	Mean in Original Scale				0.51		Mean in Log Scale				-2.75	
1899	SD in Original Scale				1.62		SD in Log Scale				1.65	
1900	95% t UCL (assumes normality of ROS data)				0.77		95% Percentile Bootstrap UCL				0.77	
1901	95% BCA Bootstrap UCL				0.87		95% Bootstrap t UCL				0.96	
1902	95% H-UCL (Log ROS)				0.40							
1903												
1904	DL/2 Statistics											
1905	DL/2 Normal					DL/2 Log-Transformed						
1906	Mean in Original Scale				0.52		Mean in Log Scale				-2.76	
1907	SD in Original Scale				1.62		SD in Log Scale				1.69	
1908	95% t UCL (Assumes normality)				0.78		95% H-Stat UCL				0.43	
1909	DL/2 is not a recommended method, provided for comparisons and historical reasons											
1910												
1911	Nonparametric Distribution Free UCL Statistics											
1912	Data do not follow a Discernible Distribution at 5% Significance Level											
1913												
1914	Suggested UCL to Use											
1915	95% KM (Chebyshev) UCL				1.20							
1916												
1917	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1918	Recommendations are based upon data size, data distribution, and skewness.											
1919	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
1920	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
1921												
1922												
1923	Cobalt											
1924												
1925	General Statistics											
1926	Total Number of Observations				107		Number of Distinct Observations				89	
1927							Number of Missing Observations				0	
1928	Minimum				0.88		Mean				2.59	
1929	Maximum				11.3		Median				2.36	
1930	SD				1.30		Std. Error of Mean				0.12	
1931	Coefficient of Variation				0.50		Skewness				3.09	
1932												
1933	Normal GOF Test											
1934	Shapiro Wilk Test Statistic				0.80		Shapiro Wilk GOF Test					
1935	5% Shapiro Wilk P Value				0		Data Not Normal at 5% Significance Level					
1936	Lilliefors Test Statistic				0.12		Lilliefors GOF Test					
1937	5% Lilliefors Critical Value				0.08		Data Not Normal at 5% Significance Level					
1938	Data Not Normal at 5% Significance Level											
1939												
1940	Assuming Normal Distribution											
1941	95% Normal UCL					95% UCLs (Adjusted for Skewness)						
1942	95% Student's-t UCL				2.80		95% Adjusted-CLT UCL (Chen-1995)				2.84	
1943							95% Modified-t UCL (Johnson-1978)				2.80	
1944												
1945	Gamma GOF Test											
1946	A-D Test Statistic				0.65		Anderson-Darling Gamma GOF Test					
1947	5% A-D Critical Value				0.75		Data appear Gamma Distributed at 5% Significance Level					
1948	K-S Test Statistic				0.06		Kolmogorov-Smirnov Gamma GOF Test					
1949	5% K-S Critical Value				0.08		Data appear Gamma Distributed at 5% Significance Level					
1950	Detected data appear Gamma Distributed at 5% Significance Level											
1951												
1952	Gamma Statistics											
1953	k hat (MLE)				5.44		k star (bias corrected MLE)				5.29	

	A	B	C	D	E	F	G	H	I	J	K	L
1954	Theta hat (MLE)					0.47	Theta star (bias corrected MLE)					0.49
1955	nu hat (MLE)					1165	nu star (bias corrected)					1133
1956	MLE Mean (bias corrected)					2.59	MLE Sd (bias corrected)					1.12
1957							Approximate Chi Square Value (0.05)					1056
1958	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					1055
1959												
1960	Assuming Gamma Distribution											
1961	roximate Gamma UCL (use when n>=50)					2.78	Adjusted Gamma UCL (use when n<50)					2.78
1962												
1963	Lognormal GOF Test											
1964	Shapiro Wilk Test Statistic					0.98	Shapiro Wilk Lognormal GOF Test					
1965	5% Shapiro Wilk P Value					0.68	Data appear Lognormal at 5% Significance Level					
1966	Lilliefors Test Statistic					0.04	Lilliefors Lognormal GOF Test					
1967	5% Lilliefors Critical Value					0.08	Data appear Lognormal at 5% Significance Level					
1968	Data appear Lognormal at 5% Significance Level											
1969												
1970	Lognormal Statistics											
1971	Minimum of Logged Data					-0.11	Mean of logged Data					0.85
1972	Maximum of Logged Data					2.42	SD of logged Data					0.42
1973												
1974	Assuming Lognormal Distribution											
1975	95% H-UCL					2.78	90% Chebyshev (MVUE) UCL					2.91
1976	95% Chebyshev (MVUE) UCL					3.06	97.5% Chebyshev (MVUE) UCL					3.27
1977	99% Chebyshev (MVUE) UCL					3.68						
1978												
1979	Nonparametric Distribution Free UCL Statistics											
1980	Data appear to follow a Discernible Distribution at 5% Significance Level											
1981												
1982	Nonparametric Distribution Free UCLs											
1983	95% CLT UCL					2.80	95% Jackknife UCL					2.80
1984	95% Standard Bootstrap UCL					2.80	95% Bootstrap-t UCL					2.85
1985	95% Hall's Bootstrap UCL					2.91	95% Percentile Bootstrap UCL					2.80
1986	95% BCA Bootstrap UCL					2.86						
1987	90% Chebyshev(Mean, Sd) UCL					2.97	95% Chebyshev(Mean, Sd) UCL					3.14
1988	97.5% Chebyshev(Mean, Sd) UCL					3.38	99% Chebyshev(Mean, Sd) UCL					3.84
1989												
1990	Suggested UCL to Use											
1991	95% Approximate Gamma UCL					2.78						
1992												
1993	tions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
1994	mmendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
1995	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
1996	For additional insight the user may want to consult a statistician.											
1997												
1998												
1999	Copper											
2000												
2001	General Statistics											
2002	Total Number of Observations					107	Number of Distinct Observations					102
2003							Number of Missing Observations					0
2004	Minimum					1.79	Mean					88.2
2005	Maximum					4870	Median					6.39
2006	SD					537.2	Std. Error of Mean					51.9
2007	Coefficient of Variation					6.08	Skewness					7.91
2008												
2009	Normal GOF Test											
2010	Shapiro Wilk Test Statistic					0.16	Shapiro Wilk GOF Test					
2011	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level					
2012	Lilliefors Test Statistic					0.47	Lilliefors GOF Test					
2013	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level					
2014	Data Not Normal at 5% Significance Level											
2015												
2016	Assuming Normal Distribution											

	A	B	C	D	E	F	G	H	I	J	K	L
2017	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2018	95% Student's-t UCL					174.4	95% Adjusted-CLT UCL (Chen-1995)					216.1
2019							95% Modified-t UCL (Johnson-1978)					181
2020												
2021	Gamma GOF Test											
2022	A-D Test Statistic					26.84	Anderson-Darling Gamma GOF Test					
2023	5% A-D Critical Value					0.86	Data Not Gamma Distributed at 5% Significance Level					
2024	K-S Test Statistic					0.38	Kolmogrov-Smirnoff Gamma GOF Test					
2025	5% K-S Critical Value					0.09	Data Not Gamma Distributed at 5% Significance Level					
2026	Data Not Gamma Distributed at 5% Significance Level											
2027												
2028	Gamma Statistics											
2029	k hat (MLE)					0.30	k star (bias corrected MLE)					0.30
2030	Theta hat (MLE)					290.8	Theta star (bias corrected MLE)					293
2031	nu hat (MLE)					64.94	nu star (bias corrected)					64.44
2032	MLE Mean (bias corrected)					88.25	MLE Sd (bias corrected)					160.8
2033							Approximate Chi Square Value (0.05)					46.94
2034	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					46.74
2035												
2036	Assuming Gamma Distribution											
2037	Approximate Gamma UCL (use when n>=50))					121	Adjusted Gamma UCL (use when n<50)					121.6
2038												
2039	Lognormal GOF Test											
2040	Shapiro Wilk Test Statistic					0.70	Shapiro Wilk Lognormal GOF Test					
2041	5% Shapiro Wilk P Value					0	Data Not Lognormal at 5% Significance Level					
2042	Lilliefors Test Statistic					0.24	Lilliefors Lognormal GOF Test					
2043	5% Lilliefors Critical Value					0.085	Data Not Lognormal at 5% Significance Level					
2044	Data Not Lognormal at 5% Significance Level											
2045												
2046	Lognormal Statistics											
2047	Minimum of Logged Data					0.58	Mean of logged Data					2.21
2048	Maximum of Logged Data					8.49	SD of logged Data					1.21
2049												
2050	Assuming Lognormal Distribution											
2051	95% H-UCL					25.34	90% Chebyshev (MVUE) UCL					27.3
2052	95% Chebyshev (MVUE) UCL					31.15	97.5% Chebyshev (MVUE) UCL					36.44
2053	99% Chebyshev (MVUE) UCL					46.95						
2054												
2055	Nonparametric Distribution Free UCL Statistics											
2056	Data do not follow a Discernible Distribution (0.05)											
2057												
2058	Nonparametric Distribution Free UCLs											
2059	95% CLT UCL					173.7	95% Jackknife UCL					174.4
2060	95% Standard Bootstrap UCL					173.9	95% Bootstrap-t UCL					972.7
2061	95% Hall's Bootstrap UCL					942.6	95% Percentile Bootstrap UCL					182.2
2062	95% BCA Bootstrap UCL					233						
2063	90% Chebyshev(Mean, Sd) UCL					244	95% Chebyshev(Mean, Sd) UCL					314.6
2064	97.5% Chebyshev(Mean, Sd) UCL					412.5	99% Chebyshev(Mean, Sd) UCL					604.9
2065												
2066	Suggested UCL to Use											
2067	95% Chebyshev (Mean, Sd) UCL					314.6						
2068												
2069	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2070	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh											
2071	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
2072	For additional insight the user may want to consult a statistician.											
2073												
2074	Cyanide (Total)											
2075												
2076	General Statistics											
2077	Total Number of Observations					107	Number of Distinct Observations					97
2078	Number of Detects					74	Number of Non-Detects					33
2079	Number of Distinct Detects					71	Number of Distinct Non-Detects					28

	A	B	C	D	E	F	G	H	I	J	K	L
2080				Minimum Detect	0.07				Minimum Non-Detect		0.24	
2081				Maximum Detect	4.24				Maximum Non-Detect		0.38	
2082				Variance Detects	0.45				Percent Non-Detects		30.8	
2083				Mean Detects	0.57				SD Detects		0.67	
2084				Median Detects	0.36				CV Detects		1.18	
2085				Skewness Detects	3.14				Kurtosis Detects		12.7	
2086				Mean of Logged Detects	-1.02				SD of Logged Detects		0.94	
2087												
2088				Normal GOF Test on Detects Only								
2089				Shapiro Wilk Test Statistic	0.67		Normal GOF Test on Detected Observations Only					
2090				5% Shapiro Wilk P Value	0		Detected Data Not Normal at 5% Significance Level					
2091				Lilliefors Test Statistic	0.23		Lilliefors GOF Test					
2092				5% Lilliefors Critical Value	0.10		Detected Data Not Normal at 5% Significance Level					
2093				Detected Data Not Normal at 5% Significance Level								
2094												
2095				Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs								
2096				Mean	0.43				Standard Error of Mean		0.05	
2097				SD	0.59				95% KM (BCA) UCL		0.55	
2098				95% KM (t) UCL	0.53			95% KM (Percentile Bootstrap) UCL		0.53		
2099				95% KM (z) UCL	0.53			95% KM Bootstrap t UCL		0.56		
2100				90% KM Chebyshev UCL	0.61			95% KM Chebyshev UCL		0.69		
2101				97.5% KM Chebyshev UCL	0.8			99% KM Chebyshev UCL		1.01		
2102												
2103				Gamma GOF Tests on Detected Observations Only								
2104				A-D Test Statistic	1.30		Anderson-Darling GOF Test					
2105				5% A-D Critical Value	0.77		Detected Data Not Gamma Distributed at 5% Significance Level					
2106				K-S Test Statistic	0.09		Kolmogrov-Smirnoff GOF					
2107				5% K-S Critical Value	0.10		Detected Data appear Gamma Distributed at 5% Significance Level					
2108				Detected data follow Appr. Gamma Distribution at 5% Significance Level								
2109												
2110				Gamma Statistics on Detected Data Only								
2111				k hat (MLE)	1.22				k star (bias corrected MLE)		1.18	
2112				Theta hat (MLE)	0.46				Theta star (bias corrected MLE)		0.48	
2113				nu hat (MLE)	180.9				nu star (bias corrected)		174.9	
2114				MLE Mean (bias corrected)	0.57				MLE Sd (bias corrected)		0.52	
2115												
2116				Gamma Kaplan-Meier (KM) Statistics								
2117				k hat (KM)	0.54				nu hat (KM)		117	
2118				Approximate Chi Square Value (116.99, α)	93.0				Adjusted Chi Square Value (116.99, β)		92.7	
2119				Approximate KM-UCL (use when n>=50)	0.55				Gamma Adjusted KM-UCL (use when n<50)		0.55	
2120												
2121				Gamma ROS Statistics using Imputed Non-Detects								
2122				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs								
2123				GROS may not be used when kstar of detected data is small such as < 0.1								
2124				For such situations, GROS method tends to yield inflated values of UCLs and BTVs								
2125				Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate								
2126				Minimum	0.01				Mean		0.40	
2127				Maximum	4.24				Median		0.17	
2128				SD	0.61				CV		1.53	
2129				k hat (MLE)	0.55				k star (bias corrected MLE)		0.54	
2130				Theta hat (MLE)	0.71				Theta star (bias corrected MLE)		0.73	
2131				nu hat (MLE)	119.5				nu star (bias corrected)		117.5	
2132				MLE Mean (bias corrected)	0.40				MLE Sd (bias corrected)		0.54	
2133									Adjusted Level of Significance (β)		0.04	
2134				Approximate Chi Square Value (117.52, α)	93.4				Adjusted Chi Square Value (117.52, β)		93.2	
2135				Gamma Approximate UCL (use when n>=50)	0.50				Gamma Adjusted UCL (use when n<50)		0.50	
2136												
2137				Lognormal GOF Test on Detected Observations Only								
2138				Lilliefors Test Statistic	0.07		Lilliefors GOF Test					
2139				5% Lilliefors Critical Value	0.10		Detected Data appear Lognormal at 5% Significance Level					
2140				Detected Data appear Lognormal at 5% Significance Level								
2141												
2142				Lognormal ROS Statistics Using Imputed Non-Detects								

	A	B	C	D	E	F	G	H	I	J	K	L
2143	Mean in Original Scale					0.44	Mean in Log Scale					-1.29
2144	SD in Original Scale					0.59	SD in Log Scale					0.89
2145	95% t UCL (assumes normality of ROS data)					0.53	95% Percentile Bootstrap UCL					0.54
2146	95% BCA Bootstrap UCL					0.55	95% Bootstrap t UCL					0.57
2147	95% H-UCL (Log ROS)					0.48						
2148												
2149	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2150	KM Mean (logged)					-1.33	95% H-UCL (KM -Log)					0.49
2151	KM SD (logged)					0.92	95% Critical H Value (KM-Log)					2.14
2152	KM Standard Error of Mean (logged)					0.094						
2153												
2154	DL/2 Statistics											
2155	DL/2 Normal						DL/2 Log-Transformed					
2156	Mean in Original Scale					0.43	Mean in Log Scale					-1.30
2157	SD in Original Scale					0.59	SD in Log Scale					0.89
2158	95% t UCL (Assumes normality)					0.53	95% H-Stat UCL					0.48
2159	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2160												
2161	Nonparametric Distribution Free UCL Statistics											
2162	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
2163												
2164	Suggested UCL to Use											
2165	95% KM (Percentile Bootstrap) UCL					0.53	95% GROS Approximate Gamma UCL					0.50
2166	95% Approximate Gamma KM-UCL					0.55						
2167												
2168	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2169	Recommendations are based upon data size, data distribution, and skewness.											
2170	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2171	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
2172												
2173	Di-n-butylphthalate											
2174												
2175	General Statistics											
2176	Total Number of Observations					107	Number of Distinct Observations					93
2177	Number of Detects					13	Number of Non-Detects					94
2178	Number of Distinct Detects					13	Number of Distinct Non-Detects					82
2179	Minimum Detect					0.09	Minimum Non-Detect					0.35
2180	Maximum Detect					8.07	Maximum Non-Detect					4.06
2181	Variance Detects					4.61	Percent Non-Detects					87.8
2182	Mean Detects					0.99	SD Detects					2.14
2183	Median Detects					0.37	CV Detects					2.16
2184	Skewness Detects					3.48	Kurtosis Detects					12.3
2185	Mean of Logged Detects					-0.90	SD of Logged Detects					1.13
2186												
2187	Normal GOF Test on Detects Only											
2188	Shapiro Wilk Test Statistic					0.42	Shapiro Wilk GOF Test					
2189	5% Shapiro Wilk Critical Value					0.86	Detected Data Not Normal at 5% Significance Level					
2190	Lilliefors Test Statistic					0.39	Lilliefors GOF Test					
2191	5% Lilliefors Critical Value					0.24	Detected Data Not Normal at 5% Significance Level					
2192	Detected Data Not Normal at 5% Significance Level											
2193												
2194	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2195	Mean					0.29	Standard Error of Mean					0.07
2196	SD					0.76	95% KM (BCA) UCL					0.44
2197	95% KM (t) UCL					0.42	95% KM (Percentile Bootstrap) UCL					0.43
2198	95% KM (z) UCL					0.42	95% KM Bootstrap t UCL					0.68
2199	90% KM Chebyshev UCL					0.53	95% KM Chebyshev UCL					0.64
2200	97.5% KM Chebyshev UCL					0.79	99% KM Chebyshev UCL					1.09
2201												
2202	Gamma GOF Tests on Detected Observations Only											
2203	A-D Test Statistic					1.57	Anderson-Darling GOF Test					
2204	5% A-D Critical Value					0.77	Detected Data Not Gamma Distributed at 5% Significance Level					
2205	K-S Test Statistic					0.27	Kolmogorov-Smirnov GOF					

	A	B	C	D	E	F	G	H	I	J	K	L	
2206	5% K-S Critical Value					0.24	Detected Data Not Gamma Distributed at 5% Significance Level						
2207	Detected Data Not Gamma Distributed at 5% Significance Level												
2208													
2209	Gamma Statistics on Detected Data Only												
2210	k hat (MLE)					0.67	k star (bias corrected MLE)					0.57	
2211	Theta hat (MLE)					1.46	Theta star (bias corrected MLE)					1.73	
2212	nu hat (MLE)					17.6	nu star (bias corrected)					14.8	
2213	MLE Mean (bias corrected)					0.99	MLE Sd (bias corrected)					1.31	
2214													
2215	Gamma Kaplan-Meier (KM) Statistics												
2216	k hat (KM)					0.14	nu hat (KM)					31.6	
2217	Approximate Chi Square Value (31.63, α)					19.7	Adjusted Chi Square Value (31.63, β)					19.6	
2218	Approximate KM-UCL (use when n>=50)					0.47	Gamma Adjusted KM-UCL (use when n<50)					0.47	
2219													
2220	Gamma ROS Statistics using Imputed Non-Detects												
2221	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
2222	GROS may not be used when kstar of detected data is small such as < 0.1												
2223	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
2224	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
2225	Minimum					0.01	Mean					0.13	
2226	Maximum					8.07	Median					0.01	
2227	SD					0.79	CV					6.11	
2228	k hat (MLE)					0.32	k star (bias corrected MLE)					0.32	
2229	Theta hat (MLE)					0.40	Theta star (bias corrected MLE)					0.40	
2230	nu hat (MLE)					69.0	nu star (bias corrected)					68.4	
2231	MLE Mean (bias corrected)					0.13	MLE Sd (bias corrected)					0.22	
2232							Adjusted Level of Significance (β)					0.04	
2233	Approximate Chi Square Value (68.45, α)					50.4	Adjusted Chi Square Value (68.45, β)					50.2	
2234	Gamma Approximate UCL (use when n>=50)					0.17	Gamma Adjusted UCL (use when n<50)					0.17	
2235													
2236	Lognormal GOF Test on Detected Observations Only												
2237	Shapiro Wilk Test Statistic					0.87	Shapiro Wilk GOF Test						
2238	5% Shapiro Wilk Critical Value					0.86	Detected Data appear Lognormal at 5% Significance Level						
2239	Lilliefors Test Statistic					0.16	Lilliefors GOF Test						
2240	5% Lilliefors Critical Value					0.24	Detected Data appear Lognormal at 5% Significance Level						
2241	Detected Data appear Lognormal at 5% Significance Level												
2242													
2243	Lognormal ROS Statistics Using Imputed Non-Detects												
2244	Mean in Original Scale					0.28	Mean in Log Scale					-1.62	
2245	SD in Original Scale					0.77	SD in Log Scale					0.49	
2246	95% t UCL (assumes normality of ROS data)					0.40	95% Percentile Bootstrap UCL					0.42	
2247	95% BCA Bootstrap UCL					0.51	95% Bootstrap t UCL					1.20	
2248	95% H-UCL (Log ROS)					0.24							
2249													
2250	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
2251	KM Mean (logged)					-1.59	95% H-UCL (KM -Log)					0.26	
2252	KM SD (logged)					0.57	95% Critical H Value (KM-Log)					1.87	
2253	KM Standard Error of Mean (logged)					0.13							
2254													
2255	DL/2 Statistics												
2256	DL/2 Normal						DL/2 Log-Transformed						
2257	Mean in Original Scale					0.37	Mean in Log Scale					-1.32	
2258	SD in Original Scale					0.79	SD in Log Scale					0.59	
2259	95% t UCL (Assumes normality)					0.50	95% H-Stat UCL					0.35	
2260	DL/2 is not a recommended method, provided for comparisons and historical reasons												
2261													
2262	Nonparametric Distribution Free UCL Statistics												
2263	Detected Data appear Lognormal Distributed at 5% Significance Level												
2264													
2265	Suggested UCL to Use												
2266	95% KM (BCA) UCL					0.44							
2267													
2268	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												

	A	B	C	D	E	F	G	H	I	J	K	L
2269	Recommendations are based upon data size, data distribution, and skewness.											
2270	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2271	Simulations results will not cover all Real World data sets; for additional insight the user may want to cons											
2272												
2273	Dibenz(a,h)anthracene											
2274												
2275	General Statistics											
2276	Total Number of Observations				107	Number of Distinct Observations				97		
2277	Number of Detects				11	Number of Non-Detects				96		
2278	Number of Distinct Detects				11	Number of Distinct Non-Detects				86		
2279	Minimum Detect				0.01	Minimum Non-Detect				0.03		
2280	Maximum Detect				0.94	Maximum Non-Detect				1.81		
2281	Variance Detects				0.1	Percent Non-Detects				89.7		
2282	Mean Detects				0.21	SD Detects				0.31		
2283	Median Detects				0.05	CV Detects				1.50		
2284	Skewness Detects				1.74	Kurtosis Detects				2.06		
2285	Mean of Logged Detects				-2.62	SD of Logged Detects				1.52		
2286												
2287	Normal GOF Test on Detects Only											
2288	Shapiro Wilk Test Statistic				0.68	Shapiro Wilk GOF Test						
2289	5% Shapiro Wilk Critical Value				0.85	Detected Data Not Normal at 5% Significance Level						
2290	Lilliefors Test Statistic				0.33	Lilliefors GOF Test						
2291	5% Lilliefors Critical Value				0.26	Detected Data Not Normal at 5% Significance Level						
2292	Detected Data Not Normal at 5% Significance Level											
2293												
2294	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2295	Mean				0.04	Standard Error of Mean				0.01		
2296	SD				0.11	95% KM (BCA) UCL				0.06		
2297	95% KM (t) UCL				0.06	95% KM (Percentile Bootstrap) UCL				0.06		
2298	95% KM (z) UCL				0.06	95% KM Bootstrap t UCL				0.08		
2299	90% KM Chebyshev UCL				0.07	95% KM Chebyshev UCL				0.09		
2300	97.5% KM Chebyshev UCL				0.11	99% KM Chebyshev UCL				0.15		
2301												
2302	Gamma GOF Tests on Detected Observations Only											
2303	A-D Test Statistic				0.79	Anderson-Darling GOF Test						
2304	5% A-D Critical Value				0.77	Detected Data Not Gamma Distributed at 5% Significance Level						
2305	K-S Test Statistic				0.24	Kolmogorov-Smirnov GOF						
2306	5% K-S Critical Value				0.26	Detected Data appear Gamma Distributed at 5% Significance Level						
2307	Detected data follow Appr. Gamma Distribution at 5% Significance Level											
2308												
2309	Gamma Statistics on Detected Data Only											
2310	k hat (MLE)				0.58	k star (bias corrected MLE)				0.48		
2311	Theta hat (MLE)				0.36	Theta star (bias corrected MLE)				0.43		
2312	nu hat (MLE)				12.8	nu star (bias corrected)				10.6		
2313	MLE Mean (bias corrected)				0.21	MLE Sd (bias corrected)				0.30		
2314												
2315	Gamma Kaplan-Meier (KM) Statistics											
2316	k hat (KM)				0.13	nu hat (KM)				27.8		
2317	Approximate Chi Square Value (27.84, α)				16.8	Adjusted Chi Square Value (27.84, β)				16.6		
2318	Approximate KM-UCL (use when n>=50)				0.06	Gamma Adjusted KM-UCL (use when n<50)				0.06		
2319												
2320	Gamma ROS Statistics using Imputed Non-Detects											
2321	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2322	GROS may not be used when kstar of detected data is small such as < 0.1											
2323	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2324	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2325	Minimum				0.01	Mean				0.03		
2326	Maximum				0.94	Median				0.01		
2327	SD				0.11	CV				3.75		
2328	k hat (MLE)				0.66	k star (bias corrected MLE)				0.65		
2329	Theta hat (MLE)				0.04	Theta star (bias corrected MLE)				0.04		
2330	nu hat (MLE)				142.9	nu star (bias corrected)				140.2		
2331	MLE Mean (bias corrected)				0.03	MLE Sd (bias corrected)				0.03		

	A	B	C	D	E	F	G	H	I	J	K	L	
2332						Adjusted Level of Significance (β)							0.04
2333	Approximate Chi Square Value (140.21, α)					113.8	Adjusted Chi Square Value (140.21, β)					113.5	
2334	Gamma Approximate UCL (use when $n \geq 50$)					0.03	Gamma Adjusted UCL (use when $n < 50$)					0.03	
2335													
2336	Lognormal GOF Test on Detected Observations Only												
2337	Shapiro Wilk Test Statistic					0.90	Shapiro Wilk GOF Test						
2338	5% Shapiro Wilk Critical Value					0.85	Detected Data appear Lognormal at 5% Significance Level						
2339	Lilliefors Test Statistic					0.16	Lilliefors GOF Test						
2340	5% Lilliefors Critical Value					0.26	Detected Data appear Lognormal at 5% Significance Level						
2341	Detected Data appear Lognormal at 5% Significance Level												
2342													
2343	Lognormal ROS Statistics Using Imputed Non-Detects												
2344	Mean in Original Scale					0.04	Mean in Log Scale					-3.77	
2345	SD in Original Scale					0.11	SD in Log Scale					0.64	
2346	95% t UCL (assumes normality of ROS data)					0.05	95% Percentile Bootstrap UCL					0.05	
2347	95% BCA Bootstrap UCL					0.06	95% Bootstrap t UCL					0.15	
2348	95% H-UCL (Log ROS)					0.03							
2349													
2350	Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
2351	KM Mean (logged)					-3.77	95% H-UCL (KM -Log)					0.03	
2352	KM SD (logged)					0.69	95% Critical H Value (KM-Log)					1.95	
2353	KM Standard Error of Mean (logged)					0.15							
2354													
2355	DL/2 Statistics												
2356	DL/2 Normal					DL/2 Log-Transformed							
2357	Mean in Original Scale					0.05	Mean in Log Scale					-3.46	
2358	SD in Original Scale					0.14	SD in Log Scale					0.81	
2359	95% t UCL (Assumes normality)					0.08	95% H-Stat UCL					0.05	
2360	DL/2 is not a recommended method, provided for comparisons and historical reasons												
2361													
2362	Nonparametric Distribution Free UCL Statistics												
2363	Detected Data appear Approximate Gamma Distributed at 5% Significance Level												
2364													
2365	Suggested UCL to Use												
2366	95% KM (t) UCL					0.06	95% GROS Approximate Gamma UCL					0.03	
2367	95% Approximate Gamma KM-UCL					0.06							
2368													
2369	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
2370	Recommendations are based upon data size, data distribution, and skewness.												
2371	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
2372	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												
2373													
2374	Dibenzofuran												
2375													
2376	General Statistics												
2377	Total Number of Observations					107	Number of Distinct Observations					94	
2378	Number of Detects					6	Number of Non-Detects					101	
2379	Number of Distinct Detects					6	Number of Distinct Non-Detects					89	
2380	Minimum Detect					0.34	Minimum Non-Detect					0.35	
2381	Maximum Detect					2.94	Maximum Non-Detect					18.1	
2382	Variance Detects					1.01	Percent Non-Detects					94.3	
2383	Mean Detects					0.89	SD Detects					1.00	
2384	Median Detects					0.50	CV Detects					1.12	
2385	Skewness Detects					2.38	Kurtosis Detects					5.74	
2386	Mean of Logged Detects					-0.44	SD of Logged Detects					0.78	
2387													
2388	Normal GOF Test on Detects Only												
2389	Shapiro Wilk Test Statistic					0.60	Shapiro Wilk GOF Test						
2390	5% Shapiro Wilk Critical Value					0.78	Detected Data Not Normal at 5% Significance Level						
2391	Lilliefors Test Statistic					0.42	Lilliefors GOF Test						
2392	5% Lilliefors Critical Value					0.36	Detected Data Not Normal at 5% Significance Level						
2393	Detected Data Not Normal at 5% Significance Level												
2394													

A	B	C	D	E	F	G	H	I	J	K	L
2395	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
2396	Mean				0.37	Standard Error of Mean				0.02	
2397	SD				0.25	95% KM (BCA) UCL				0.45	
2398	95% KM (t) UCL				0.42	95% KM (Percentile Bootstrap) UCL				0.42	
2399	95% KM (z) UCL				0.42	95% KM Bootstrap t UCL				0.54	
2400	90% KM Chebyshev UCL				0.45	95% KM Chebyshev UCL				0.49	
2401	97.5% KM Chebyshev UCL				0.54	99% KM Chebyshev UCL				0.64	
2402											
2403	Gamma GOF Tests on Detected Observations Only										
2404	A-D Test Statistic				0.95	Anderson-Darling GOF Test					
2405	5% A-D Critical Value				0.70	Detected Data Not Gamma Distributed at 5% Significance Level					
2406	K-S Test Statistic				0.37	Kolmogrov-Smirnoff GOF					
2407	5% K-S Critical Value				0.33	Detected Data Not Gamma Distributed at 5% Significance Level					
2408	Detected Data Not Gamma Distributed at 5% Significance Level										
2409											
2410	Gamma Statistics on Detected Data Only										
2411	k hat (MLE)				1.64	k star (bias corrected MLE)				0.93	
2412	Theta hat (MLE)				0.54	Theta star (bias corrected MLE)				0.95	
2413	nu hat (MLE)				19.7	nu star (bias corrected)				11.2	
2414	MLE Mean (bias corrected)				0.89	MLE Sd (bias corrected)				0.92	
2415											
2416	Gamma Kaplan-Meier (KM) Statistics										
2417	k hat (KM)				2.16	nu hat (KM)				462.7	
2418	Approximate Chi Square Value (462.65, α)				413.8	Adjusted Chi Square Value (462.65, β)				413.2	
2419	Approximate KM-UCL (use when $n \geq 50$)				0.42	Gamma Adjusted KM-UCL (use when $n < 50$)				0.42	
2420											
2421	Gamma ROS Statistics using Imputed Non-Detects										
2422	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
2423	GROS may not be used when kstar of detected data is small such as < 0.1										
2424	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
2425	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
2426	Minimum				0.01	Mean				0.05	
2427	Maximum				2.94	Median				0.01	
2428	SD				0.29	CV				5.03	
2429	k hat (MLE)				0.42	k star (bias corrected MLE)				0.41	
2430	Theta hat (MLE)				0.14	Theta star (bias corrected MLE)				0.14	
2431	nu hat (MLE)				90.0	nu star (bias corrected)				88.8	
2432	MLE Mean (bias corrected)				0.05	MLE Sd (bias corrected)				0.09	
2433						Adjusted Level of Significance (β)				0.04	
2434	Approximate Chi Square Value (88.88, α)				68.1	Adjusted Chi Square Value (88.88, β)				67.8	
2435	Gamma Approximate UCL (use when $n \geq 50$)				0.07	Gamma Adjusted UCL (use when $n < 50$)				0.07	
2436											
2437	Lognormal GOF Test on Detected Observations Only										
2438	Shapiro Wilk Test Statistic				0.77	Shapiro Wilk GOF Test					
2439	5% Shapiro Wilk Critical Value				0.78	Detected Data Not Lognormal at 5% Significance Level					
2440	Lilliefors Test Statistic				0.31	Lilliefors GOF Test					
2441	5% Lilliefors Critical Value				0.36	Detected Data appear Lognormal at 5% Significance Level					
2442	Detected Data appear Approximate Lognormal at 5% Significance Level										
2443											
2444	Lognormal ROS Statistics Using Imputed Non-Detects										
2445	Mean in Original Scale				0.27	Mean in Log Scale				-1.39	
2446	SD in Original Scale				0.26	SD in Log Scale				0.31	
2447	95% t UCL (assumes normality of ROS data)				0.31	95% Percentile Bootstrap UCL				0.32	
2448	95% BCA Bootstrap UCL				0.35	95% Bootstrap t UCL				0.44	
2449	95% H-UCL (Log ROS)				0.27						
2450											
2451	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										
2452	KM Mean (logged)				-1.03	95% H-UCL (KM -Log)				0.37	
2453	KM SD (logged)				0.22	95% Critical H Value (KM-Log)				1.70	
2454	KM Standard Error of Mean (logged)				0.02						
2455											
2456	DL/2 Statistics										
2457	DL/2 Normal					DL/2 Log-Transformed					

	A	B	C	D	E	F	G	H	I	J	K	L
2458	Mean in Original Scale					0.42	Mean in Log Scale					-1.25
2459	SD in Original Scale					0.91	SD in Log Scale					0.64
2460	95% t UCL (Assumes normality)					0.57	95% H-Stat UCL					0.39
2461	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2462												
2463	Nonparametric Distribution Free UCL Statistics											
2464	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
2465												
2466	Suggested UCL to Use											
2467	95% KM (t) UCL					0.42	95% KM (% Bootstrap) UCL					0.42
2468												
2469	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2470	Recommendations are based upon data size, data distribution, and skewness.											
2471	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2472	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
2473												
2474	Fluoranthene											
2475												
2476	General Statistics											
2477	Total Number of Observations					107	Number of Distinct Observations					104
2478	Number of Detects					59	Number of Non-Detects					48
2479	Number of Distinct Detects					59	Number of Distinct Non-Detects					46
2480	Minimum Detect					0.011	Minimum Non-Detect					0.03
2481	Maximum Detect					79.8	Maximum Non-Detect					0.40
2482	Variance Detects					111.8	Percent Non-Detects					44.8
2483	Mean Detects					2.65	SD Detects					10.5
2484	Median Detects					0.14	CV Detects					3.97
2485	Skewness Detects					6.94	Kurtosis Detects					51.0
2486	Mean of Logged Detects					-1.47	SD of Logged Detects					2.10
2487												
2488	Normal GOF Test on Detects Only											
2489	Shapiro Wilk Test Statistic					0.26	Normal GOF Test on Detected Observations Only					
2490	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
2491	Lilliefors Test Statistic					0.40	Lilliefors GOF Test					
2492	5% Lilliefors Critical Value					0.11	Detected Data Not Normal at 5% Significance Level					
2493	Detected Data Not Normal at 5% Significance Level											
2494												
2495	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2496	Mean					1.47	Standard Error of Mean					0.77
2497	SD					7.89	95% KM (BCA) UCL					3.05
2498	95% KM (t) UCL					2.75	95% KM (Percentile Bootstrap) UCL					2.93
2499	95% KM (z) UCL					2.74	95% KM Bootstrap t UCL					6.20
2500	90% KM Chebyshev UCL					3.78	95% KM Chebyshev UCL					4.83
2501	97.5% KM Chebyshev UCL					6.28	99% KM Chebyshev UCL					9.13
2502												
2503	Gamma GOF Tests on Detected Observations Only											
2504	A-D Test Statistic					5.00	Anderson-Darling GOF Test					
2505	5% A-D Critical Value					0.87	ed Data Not Gamma Distributed at 5% Significance Level					
2506	K-S Test Statistic					0.22	Kolmogrov-Smirnoff GOF					
2507	5% K-S Critical Value					0.12	ed Data Not Gamma Distributed at 5% Significance Level					
2508	Detected Data Not Gamma Distributed at 5% Significance Level											
2509												
2510	Gamma Statistics on Detected Data Only											
2511	k hat (MLE)					0.28	k star (bias corrected MLE)					0.28
2512	Theta hat (MLE)					9.36	Theta star (bias corrected MLE)					9.46
2513	nu hat (MLE)					33.5	nu star (bias corrected)					33.1
2514	MLE Mean (bias corrected)					2.65	MLE Sd (bias corrected)					5.01
2515												
2516	Gamma Kaplan-Meier (KM) Statistics											
2517	k hat (KM)					0.03	nu hat (KM)					7.50
2518	Approximate Chi Square Value (7.50, α)					2.45	Adjusted Chi Square Value (7.50, β)					2.41
2519	Approximate KM-UCL (use when n>=50)					4.52	mma Adjusted KM-UCL (use when n<50)					4.59
2520	Gamma (KM) may not be used when k hat (KM) is < 0.1											

	A	B	C	D	E	F	G	H	I	J	K	L	
2521													
2522	Gamma ROS Statistics using Imputed Non-Detects												
2523	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
2524	GROS may not be used when kstar of detected data is small such as < 0.1												
2525	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
2526	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate												
2527	Minimum				0.01				Mean				1.47
2528	Maximum				79.8				Median				0.02
2529	SD				7.93				CV				5.39
2530	k hat (MLE)				0.22				k star (bias corrected MLE)				0.22
2531	Theta hat (MLE)				6.62				Theta star (bias corrected MLE)				6.62
2532	nu hat (MLE)				47.49				nu star (bias corrected)				47.49
2533	MLE Mean (bias corrected)				1.47				MLE Sd (bias corrected)				3.12
2534									Adjusted Level of Significance (β)				0.04
2535	Approximate Chi Square Value (47.49, α)				32.61				Adjusted Chi Square Value (47.49, β)				32.51
2536	Gamma Approximate UCL (use when $n \geq 50$)				2.13				Gamma Adjusted UCL (use when $n < 50$)				2.14
2537													
2538	Lognormal GOF Test on Detected Observations Only												
2539	Lilliefors Test Statistic				0.12				Lilliefors GOF Test				
2540	5% Lilliefors Critical Value				0.11				Detected Data Not Lognormal at 5% Significance Level				
2541	Detected Data Not Lognormal at 5% Significance Level												
2542													
2543	Lognormal ROS Statistics Using Imputed Non-Detects												
2544	Mean in Original Scale				1.47				Mean in Log Scale				-2.59
2545	SD in Original Scale				7.93				SD in Log Scale				2.00
2546	95% t UCL (assumes normality of ROS data)				2.74				95% Percentile Bootstrap UCL				2.95
2547	95% BCA Bootstrap UCL				3.79				95% Bootstrap t UCL				6.36
2548	95% H-UCL (Log ROS)				1.07								
2549													
2550	DL/2 Statistics												
2551	DL/2 Normal				DL/2 Log-Transformed								
2552	Mean in Original Scale				1.48				Mean in Log Scale				-2.45
2553	SD in Original Scale				7.93				SD in Log Scale				1.93
2554	95% t UCL (Assumes normality)				2.75				95% H-Stat UCL				1.02
2555	DL/2 is not a recommended method, provided for comparisons and historical reasons												
2556													
2557	Nonparametric Distribution Free UCL Statistics												
2558	Data do not follow a Discernible Distribution at 5% Significance Level												
2559													
2560	Suggested UCL to Use												
2561	97.5% KM (Chebyshev) UCL				6.28								
2562													
2563	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
2564	Recommendations are based upon data size, data distribution, and skewness.												
2565	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
2566	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult												
2567													
2568	Fluorene												
2569													
2570	General Statistics												
2571	Total Number of Observations				107				Number of Distinct Observations				99
2572	Number of Detects				22				Number of Non-Detects				85
2573	Number of Distinct Detects				21				Number of Distinct Non-Detects				78
2574	Minimum Detect				0.01				Minimum Non-Detect				0.03
2575	Maximum Detect				4				Maximum Non-Detect				1.81
2576	Variance Detects				0.74				Percent Non-Detects				79.4
2577	Mean Detects				0.41				SD Detects				0.86
2578	Median Detects				0.09				CV Detects				2.09
2579	Skewness Detects				3.76				Kurtosis Detects				15.6
2580	Mean of Logged Detects				-2.20				SD of Logged Detects				1.65
2581													
2582	Normal GOF Test on Detects Only												
2583	Shapiro Wilk Test Statistic				0.48				Shapiro Wilk GOF Test				

A	B	C	D	E	F	G	H	I	J	K	L
2584	5% Shapiro Wilk Critical Value				0.91	Detected Data Not Normal at 5% Significance Level					
2585	Lilliefors Test Statistic				0.32	Lilliefors GOF Test					
2586	5% Lilliefors Critical Value				0.18	Detected Data Not Normal at 5% Significance Level					
2587	Detected Data Not Normal at 5% Significance Level										
2588											
2589	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
2590	Mean				0.09	Standard Error of Mean				0.04	
2591	SD				0.41	95% KM (BCA) UCL				0.17	
2592	95% KM (t) UCL				0.16	95% KM (Percentile Bootstrap) UCL				0.17	
2593	95% KM (z) UCL				0.16	95% KM Bootstrap t UCL				0.27	
2594	90% KM Chebyshev UCL				0.22	95% KM Chebyshev UCL				0.27	
2595	97.5% KM Chebyshev UCL				0.35	99% KM Chebyshev UCL				0.50	
2596											
2597	Gamma GOF Tests on Detected Observations Only										
2598	A-D Test Statistic				1.2	Anderson-Darling GOF Test					
2599	5% A-D Critical Value				0.80	Detected Data Not Gamma Distributed at 5% Significance Level					
2600	K-S Test Statistic				0.24	Kolmogrov-Smirnoff GOF					
2601	5% K-S Critical Value				0.19	Detected Data Not Gamma Distributed at 5% Significance Level					
2602	Detected Data Not Gamma Distributed at 5% Significance Level										
2603											
2604	Gamma Statistics on Detected Data Only										
2605	k hat (MLE)				0.48	k star (bias corrected MLE)				0.44	
2606	Theta hat (MLE)				0.84	Theta star (bias corrected MLE)				0.91	
2607	nu hat (MLE)				21.3	nu star (bias corrected)				19.7	
2608	MLE Mean (bias corrected)				0.41	MLE Sd (bias corrected)				0.61	
2609											
2610	Gamma Kaplan-Meier (KM) Statistics										
2611	k hat (KM)				0.05	nu hat (KM)				12.1	
2612	Approximate Chi Square Value (12.17, α)				5.34	Adjusted Chi Square Value (12.17, β)				5.27	
2613	Approximate KM-UCL (use when $n \geq 50$)				0.22	Gamma Adjusted KM-UCL (use when $n < 50$)				0.22	
2614	Gamma (KM) may not be used when k hat (KM) is < 0.1										
2615											
2616	Gamma ROS Statistics using Imputed Non-Detects										
2617	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs										
2618	GROS may not be used when kstar of detected data is small such as < 0.1										
2619	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
2620	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
2621	Minimum				0.01	Mean				0.09	
2622	Maximum				4	Median				0.01	
2623	SD				0.41	CV				4.49	
2624	k hat (MLE)				0.38	k star (bias corrected MLE)				0.37	
2625	Theta hat (MLE)				0.24	Theta star (bias corrected MLE)				0.24	
2626	nu hat (MLE)				81.8	nu star (bias corrected)				80.9	
2627	MLE Mean (bias corrected)				0.09	MLE Sd (bias corrected)				0.15	
2628						Adjusted Level of Significance (β)				0.04	
2629	Approximate Chi Square Value (80.92, α)				61.1	Adjusted Chi Square Value (80.92, β)				60.9	
2630	Gamma Approximate UCL (use when $n \geq 50$)				0.12	Gamma Adjusted UCL (use when $n < 50$)				0.12	
2631											
2632	Lognormal GOF Test on Detected Observations Only										
2633	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test					
2634	5% Shapiro Wilk Critical Value				0.91	Detected Data appear Lognormal at 5% Significance Level					
2635	Lilliefors Test Statistic				0.14	Lilliefors GOF Test					
2636	5% Lilliefors Critical Value				0.18	Detected Data appear Lognormal at 5% Significance Level					
2637	Detected Data appear Lognormal at 5% Significance Level										
2638											
2639	Lognormal ROS Statistics Using Imputed Non-Detects										
2640	Mean in Original Scale				0.09	Mean in Log Scale				-3.77	
2641	SD in Original Scale				0.41	SD in Log Scale				1.11	
2642	5% t UCL (assumes normality of ROS data)				0.16	95% Percentile Bootstrap UCL				0.17	
2643	95% BCA Bootstrap UCL				0.21	95% Bootstrap t UCL				0.28	
2644	95% H-UCL (Log ROS)				0.05						
2645											
2646	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										

	A	B	C	D	E	F	G	H	I	J	K	L
2647	KM Mean (logged)					-3.74	95% H-UCL (KM -Log)					0.05
2648	KM SD (logged)					1.12	95% Critical H Value (KM-Log)					2.32
2649	KM Standard Error of Mean (logged)					0.15						
2650												
2651	DL/2 Statistics											
2652	DL/2 Normal					DL/2 Log-Transformed						
2653	Mean in Original Scale					0.11	Mean in Log Scale					-3.33
2654	SD in Original Scale					0.42	SD in Log Scale					1.08
2655	95% t UCL (Assumes normality)					0.18	95% H-Stat UCL					0.08
2656	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2657												
2658	Nonparametric Distribution Free UCL Statistics											
2659	Detected Data appear Lognormal Distributed at 5% Significance Level											
2660												
2661	Suggested UCL to Use											
2662	95% KM (Chebyshev) UCL					0.27						
2663												
2664	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2665	Recommendations are based upon data size, data distribution, and skewness.											
2666	hmmendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
2667	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
2668												
2669	Indeno(1,2,3-cd)pyrene											
2670												
2671	General Statistics											
2672	Total Number of Observations					107	Number of Distinct Observations					101
2673	Number of Detects					35	Number of Non-Detects					72
2674	Number of Distinct Detects					35	Number of Distinct Non-Detects					66
2675	Minimum Detect					0.01	Minimum Non-Detect					0.03
2676	Maximum Detect					4.65	Maximum Non-Detect					1.81
2677	Variance Detects					1.15	Percent Non-Detects					67.2
2678	Mean Detects					0.66	SD Detects					1.07
2679	Median Detects					0.13	CV Detects					1.60
2680	Skewness Detects					2.25	Kurtosis Detects					5.12
2681	Mean of Logged Detects					-1.70	SD of Logged Detects					1.73
2682												
2683	Normal GOF Test on Detects Only											
2684	Shapiro Wilk Test Statistic					0.66	Shapiro Wilk GOF Test					
2685	5% Shapiro Wilk Critical Value					0.93	Detected Data Not Normal at 5% Significance Level					
2686	Lilliefors Test Statistic					0.28	Lilliefors GOF Test					
2687	5% Lilliefors Critical Value					0.15	Detected Data Not Normal at 5% Significance Level					
2688	Detected Data Not Normal at 5% Significance Level											
2689												
2690	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2691	Mean					0.23	Standard Error of Mean					0.06
2692	SD					0.67	95% KM (BCA) UCL					0.35
2693	95% KM (t) UCL					0.34	95% KM (Percentile Bootstrap) UCL					0.35
2694	95% KM (z) UCL					0.34	95% KM Bootstrap t UCL					0.4
2695	90% KM Chebyshev UCL					0.43	95% KM Chebyshev UCL					0.52
2696	97.5% KM Chebyshev UCL					0.65	99% KM Chebyshev UCL					0.89
2697												
2698	Gamma GOF Tests on Detected Observations Only											
2699	A-D Test Statistic					1.40	Anderson-Darling GOF Test					
2700	5% A-D Critical Value					0.81	ed Data Not Gamma Distributed at 5% Significanc					
2701	K-S Test Statistic					0.21	Kolmogrov-Smirnoff GOF					
2702	5% K-S Critical Value					0.15	ed Data Not Gamma Distributed at 5% Significanc					
2703	Detected Data Not Gamma Distributed at 5% Significance Level											
2704												
2705	Gamma Statistics on Detected Data Only											
2706	k hat (MLE)					0.49	k star (bias corrected MLE)					0.46
2707	Theta hat (MLE)					1.36	Theta star (bias corrected MLE)					1.42
2708	nu hat (MLE)					34.3	nu star (bias corrected)					32.7
2709	MLE Mean (bias corrected)					0.66	MLE Sd (bias corrected)					0.97

	A	B	C	D	E	F	G	H	I	J	K	L
2710												
2711	Gamma Kaplan-Meier (KM) Statistics											
2712	k hat (KM)					0.12		nu hat (KM)			26.03	
2713	Approximate Chi Square Value (26.03, α)					15.41		Adjusted Chi Square Value (26.03, β)			15.21	
2714	Approximate KM-UCL (use when n>=50)					0.39		Gamma Adjusted KM-UCL (use when n<50)			0.40	
2715												
2716	Gamma ROS Statistics using Imputed Non-Detects											
2717	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2718	GROS may not be used when kstar of detected data is small such as < 0.1											
2719	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2720	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
2721	Minimum					0.01		Mean			0.22	
2722	Maximum					4.65		Median			0.01	
2723	SD					0.68		CV			3.03	
2724	k hat (MLE)					0.31		k star (bias corrected MLE)			0.31	
2725	Theta hat (MLE)					0.71		Theta star (bias corrected MLE)			0.71	
2726	nu hat (MLE)					67.6		nu star (bias corrected)			67.04	
2727	MLE Mean (bias corrected)					0.22		MLE Sd (bias corrected)			0.40	
2728								Adjusted Level of Significance (β)			0.04	
2729	Approximate Chi Square Value (67.04, α)					49.2		Adjusted Chi Square Value (67.04, β)			48.99	
2730	Gamma Approximate UCL (use when n>=50)					0.30		Gamma Adjusted UCL (use when n<50)			0.30	
2731												
2732	Lognormal GOF Test on Detected Observations Only											
2733	Shapiro Wilk Test Statistic					0.93		Shapiro Wilk GOF Test				
2734	5% Shapiro Wilk Critical Value					0.93		Detected Data Not Lognormal at 5% Significance Level				
2735	Lilliefors Test Statistic					0.12		Lilliefors GOF Test				
2736	5% Lilliefors Critical Value					0.15		Detected Data appear Lognormal at 5% Significance Level				
2737	Detected Data appear Approximate Lognormal at 5% Significance Level											
2738												
2739	Lognormal ROS Statistics Using Imputed Non-Detects											
2740	Mean in Original Scale					0.23		Mean in Log Scale			-3.16	
2741	SD in Original Scale					0.68		SD in Log Scale			1.43	
2742	95% t UCL (assumes normality of ROS data)					0.34		95% Percentile Bootstrap UCL			0.35	
2743	95% BCA Bootstrap UCL					0.38		95% Bootstrap t UCL			0.39	
2744	95% H-UCL (Log ROS)					0.17						
2745												
2746	Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
2747	KM Mean (logged)					-3.07		95% H-UCL (KM -Log)			0.17	
2748	KM SD (logged)					1.40		95% Critical H Value (KM-Log)			2.61	
2749	KM Standard Error of Mean (logged)					0.15						
2750												
2751	DL/2 Statistics											
2752	DL/2 Normal					DL/2 Log-Transformed						
2753	Mean in Original Scale					0.24		Mean in Log Scale			-3.01	
2754	SD in Original Scale					0.68		SD in Log Scale			1.44	
2755	95% t UCL (Assumes normality)					0.35		95% H-Stat UCL			0.2	
2756	DL/2 is not a recommended method, provided for comparisons and historical reasons											
2757												
2758	Nonparametric Distribution Free UCL Statistics											
2759	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
2760												
2761	Suggested UCL to Use											
2762	95% KM (Chebyshev) UCL					0.52						
2763												
2764	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.											
2765	Recommendations are based upon data size, data distribution, and skewness.											
2766	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Singh (2004).											
2767	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult the literature.											
2768												
2769	Isopropyltoluene[4-]											
2770												
2771	General Statistics											
2772	Total Number of Observations					107		Number of Distinct Observations			68	

	A	B	C	D	E	F	G	H	I	J	K	L
2773	Number of Detects					40	Number of Non-Detects					67
2774	Number of Distinct Detects					37	Number of Distinct Non-Detects					32
2775	Minimum Detect					3.9900E	Minimum Non-Detect					0.001
2776	Maximum Detect					0.089	Maximum Non-Detect					0.14
2777	Variance Detects					4.4824E	Percent Non-Detects					62.6
2778	Mean Detects					0.01	SD Detects					0.02
2779	Median Detects					0.002	CV Detects					1.93
2780	Skewness Detects					2.61	Kurtosis Detects					6.11
2781	Mean of Logged Detects					-5.76	SD of Logged Detects					1.5
2782												
2783	Normal GOF Test on Detects Only											
2784	Shapiro Wilk Test Statistic					0.54	Shapiro Wilk GOF Test					
2785	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Normal at 5% Significance Level					
2786	Lilliefors Test Statistic					0.33	Lilliefors GOF Test					
2787	5% Lilliefors Critical Value					0.14	Detected Data Not Normal at 5% Significance Level					
2788	Detected Data Not Normal at 5% Significance Level											
2789												
2790	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
2791	Mean					0.004	Standard Error of Mean					0.001
2792	SD					0.01	95% KM (BCA) UCL					0.007
2793	95% KM (t) UCL					0.006	95% KM (Percentile Bootstrap) UCL					0.006
2794	95% KM (z) UCL					0.006	95% KM Bootstrap t UCL					0.008
2795	90% KM Chebyshev UCL					0.008	95% KM Chebyshev UCL					0.01
2796	97.5% KM Chebyshev UCL					0.01	99% KM Chebyshev UCL					0.01
2797												
2798	Gamma GOF Tests on Detected Observations Only											
2799	A-D Test Statistic					3.04	Anderson-Darling GOF Test					
2800	5% A-D Critical Value					0.81	Detected Data Not Gamma Distributed at 5% Significance Level					
2801	K-S Test Statistic					0.26	Kolmogrov-Smirnoff GOF					
2802	5% K-S Critical Value					0.14	Detected Data Not Gamma Distributed at 5% Significance Level					
2803	Detected Data Not Gamma Distributed at 5% Significance Level											
2804												
2805	Gamma Statistics on Detected Data Only											
2806	k hat (MLE)					0.50	k star (bias corrected MLE)					0.48
2807	Theta hat (MLE)					0.02	Theta star (bias corrected MLE)					0.02
2808	nu hat (MLE)					40.6	nu star (bias corrected)					38.8
2809	MLE Mean (bias corrected)					0.01	MLE Sd (bias corrected)					0.01
2810												
2811	Gamma Kaplan-Meier (KM) Statistics											
2812	k hat (KM)					0.11	nu hat (KM)					23.6
2813	Approximate Chi Square Value (23.67, α)					13.6	Adjusted Chi Square Value (23.67, β)					13.4
2814	Approximate KM-UCL (use when n>=50)					0.007	Gamma Adjusted KM-UCL (use when n<50)					0.008
2815												
2816	Gamma ROS Statistics using Imputed Non-Detects											
2817	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
2818	GROS may not be used when kstar of detected data is small such as < 0.1											
2819	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
2820	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
2821	Minimum					3.9900E	Mean					0.01
2822	Maximum					0.089	Median					0.01
2823	SD					0.01	CV					1.24
2824	k hat (MLE)					1.20	k star (bias corrected MLE)					1.18
2825	Theta hat (MLE)					0.008	Theta star (bias corrected MLE)					0.008
2826	nu hat (MLE)					258.6	nu star (bias corrected)					252.6
2827	MLE Mean (bias corrected)					0.01	MLE Sd (bias corrected)					0.009
2828							Adjusted Level of Significance (β)					0.04
2829	Approximate Chi Square Value (252.64, α)					216.8	Adjusted Chi Square Value (252.64, β)					216.4
2830	Gamma Approximate UCL (use when n>=50)					0.01	Gamma Adjusted UCL (use when n<50)					0.01
2831												
2832	Lognormal GOF Test on Detected Observations Only											
2833	Shapiro Wilk Test Statistic					0.91	Shapiro Wilk GOF Test					
2834	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Lognormal at 5% Significance Level					
2835	Lilliefors Test Statistic					0.16	Lilliefors GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L	
2836	5% Lilliefors Critical Value					0.14	Detected Data Not Lognormal at 5% Significance Level						
2837	Detected Data Not Lognormal at 5% Significance Level												
2838													
2839	Lognormal ROS Statistics Using Imputed Non-Detects												
2840	Mean in Original Scale					0.004	Mean in Log Scale					-6.77	
2841	SD in Original Scale					0.011	SD in Log Scale					1.28	
2842	95% t UCL (assumes normality of ROS data)					0.006	95% Percentile Bootstrap UCL					0.006	
2843	95% BCA Bootstrap UCL					0.007	95% Bootstrap t UCL					0.008	
2844	95% H-UCL (Log ROS)					0.003							
2845													
2846	DL/2 Statistics												
2847	DL/2 Normal					DL/2 Log-Transformed							
2848	Mean in Original Scale					0.005	Mean in Log Scale					-6.74	
2849	SD in Original Scale					0.011	SD in Log Scale					1.27	
2850	95% t UCL (Assumes normality)					0.007	95% H-Stat UCL					0.003	
2851	DL/2 is not a recommended method, provided for comparisons and historical reasons												
2852													
2853	Nonparametric Distribution Free UCL Statistics												
2854	Data do not follow a Discernible Distribution at 5% Significance Level												
2855													
2856	Suggested UCL to Use												
2857	95% KM (BCA) UCL					0.007							
2858													
2859	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
2860	Recommendations are based upon data size, data distribution, and skewness.												
2861	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
2862	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult												
2863													
2864													
2865	Lead												
2866													
2867	General Statistics												
2868	Total Number of Observations					107	Number of Distinct Observations					90	
2869							Number of Missing Observations					0	
2870	Minimum					4.41	Mean					18.4	
2871	Maximum					202	Median					10.6	
2872	SD					26.5	Std. Error of Mean					2.56	
2873	Coefficient of Variation					1.43	Skewness					4.75	
2874													
2875	Normal GOF Test												
2876	Shapiro Wilk Test Statistic					0.45	Shapiro Wilk GOF Test						
2877	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level						
2878	Lilliefors Test Statistic					0.33	Lilliefors GOF Test						
2879	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level						
2880	Data Not Normal at 5% Significance Level												
2881													
2882	Assuming Normal Distribution												
2883	95% Normal UCL					95% UCLs (Adjusted for Skewness)							
2884	95% Student's-t UCL					22.7	95% Adjusted-CLT UCL (Chen-1995)					23.9	
2885							95% Modified-t UCL (Johnson-1978)					22.9	
2886													
2887	Gamma GOF Test												
2888	A-D Test Statistic					10.5	Anderson-Darling Gamma GOF Test						
2889	5% A-D Critical Value					0.76	Data Not Gamma Distributed at 5% Significance Level						
2890	K-S Test Statistic					0.26	Kolmogrov-Smirnoff Gamma GOF Test						
2891	5% K-S Critical Value					0.08	Data Not Gamma Distributed at 5% Significance Level						
2892	Data Not Gamma Distributed at 5% Significance Level												
2893													
2894	Gamma Statistics												
2895	k hat (MLE)					1.54	k star (bias corrected MLE)					1.50	
2896	Theta hat (MLE)					11.9	Theta star (bias corrected MLE)					12.2	
2897	nu hat (MLE)					330.2	nu star (bias corrected)					322.3	
2898	MLE Mean (bias corrected)					18.4	MLE Sd (bias corrected)					15.0	

	A	B	C	D	E	F	G	H	I	J	K	L
2899							Approximate Chi Square Value (0.05)					281.7
2900	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					281.2
2901												
2902	Assuming Gamma Distribution											
2903	Approximate Gamma UCL (use when n>=50))					21.1	Adjusted Gamma UCL (use when n<50)					21.1
2904												
2905	Lognormal GOF Test											
2906	Shapiro Wilk Test Statistic					0.84	Shapiro Wilk Lognormal GOF Test					
2907	5% Shapiro Wilk P Value					0	Data Not Lognormal at 5% Significance Level					
2908	Lilliefors Test Statistic					0.18	Lilliefors Lognormal GOF Test					
2909	5% Lilliefors Critical Value					0.08	Data Not Lognormal at 5% Significance Level					
2910	Data Not Lognormal at 5% Significance Level											
2911												
2912	Lognormal Statistics											
2913	Minimum of Logged Data					1.48	Mean of logged Data					2.55
2914	Maximum of Logged Data					5.30	SD of logged Data					0.69
2915												
2916	Assuming Lognormal Distribution											
2917	95% H-UCL					18.7	90% Chebyshev (MVUE) UCL					19.9
2918	95% Chebyshev (MVUE) UCL					21.6	97.5% Chebyshev (MVUE) UCL					23.8
2919	99% Chebyshev (MVUE) UCL					28.3						
2920												
2921	Nonparametric Distribution Free UCL Statistics											
2922	Data do not follow a Discernible Distribution (0.05)											
2923												
2924	Nonparametric Distribution Free UCLs											
2925	95% CLT UCL					22.7	95% Jackknife UCL					22.7
2926	95% Standard Bootstrap UCL					22.6	95% Bootstrap-t UCL					25.4
2927	95% Hall's Bootstrap UCL					25.8	95% Percentile Bootstrap UCL					23
2928	95% BCA Bootstrap UCL					24.1						
2929	90% Chebyshev(Mean, Sd) UCL					26.1	95% Chebyshev(Mean, Sd) UCL					29.6
2930	97.5% Chebyshev(Mean, Sd) UCL					34.4	99% Chebyshev(Mean, Sd) UCL					43.9
2931												
2932	Suggested UCL to Use											
2933	95% Chebyshev (Mean, Sd) UCL					29.6						
2934												
2935	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
2936	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
2937	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
2938	For additional insight the user may want to consult a statistician.											
2939												
2940												
2941	Magnesium											
2942												
2943	General Statistics											
2944	Total Number of Observations					107	Number of Distinct Observations					76
2945							Number of Missing Observations					0
2946	Minimum					194	Mean					1220
2947	Maximum					2590	Median					1140
2948	SD					382.2	Std. Error of Mean					36.9
2949	Coefficient of Variation					0.31	Skewness					0.52
2950												
2951	Normal GOF Test											
2952	Shapiro Wilk Test Statistic					0.97	Shapiro Wilk GOF Test					
2953	5% Shapiro Wilk P Value					0.35	Data appear Normal at 5% Significance Level					
2954	Lilliefors Test Statistic					0.09	Lilliefors GOF Test					
2955	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level					
2956	Data appear Approximate Normal at 5% Significance Level											
2957												
2958	Assuming Normal Distribution											
2959	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
2960	95% Student's-t UCL					1281	95% Adjusted-CLT UCL (Chen-1995)					1283
2961							95% Modified-t UCL (Johnson-1978)					1281

	A	B	C	D	E	F	G	H	I	J	K	L
2962												
2963	Gamma GOF Test											
2964	A-D Test Statistic					0.76	Anderson-Darling Gamma GOF Test					
2965	5% A-D Critical Value					0.75	Data Not Gamma Distributed at 5% Significance Level					
2966	K-S Test Statistic					0.09	Kolmogrov-Smirnoff Gamma GOF Test					
2967	5% K-S Critical Value					0.08	Data Not Gamma Distributed at 5% Significance Level					
2968	Data Not Gamma Distributed at 5% Significance Level											
2969												
2970	Gamma Statistics											
2971	k hat (MLE)					9.42	k star (bias corrected MLE)					9.17
2972	Theta hat (MLE)					129.4	Theta star (bias corrected MLE)					133
2973	nu hat (MLE)					2018	nu star (bias corrected)					1963
2974	MLE Mean (bias corrected)					1220	MLE Sd (bias corrected)					402.8
2975							Approximate Chi Square Value (0.05)					1861
2976	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					1859
2977												
2978	Assuming Gamma Distribution											
2979	Approximate Gamma UCL (use when n>=50)					1287	Adjusted Gamma UCL (use when n<50)					1287
2980												
2981	Lognormal GOF Test											
2982	Shapiro Wilk Test Statistic					0.93	Shapiro Wilk Lognormal GOF Test					
2983	5% Shapiro Wilk P Value					3.2634E	Data Not Lognormal at 5% Significance Level					
2984	Lilliefors Test Statistic					0.11	Lilliefors Lognormal GOF Test					
2985	5% Lilliefors Critical Value					0.08	Data Not Lognormal at 5% Significance Level					
2986	Data Not Lognormal at 5% Significance Level											
2987												
2988	Lognormal Statistics											
2989	Minimum of Logged Data					5.26	Mean of logged Data					7.05
2990	Maximum of Logged Data					7.85	SD of logged Data					0.35
2991												
2992	Assuming Lognormal Distribution											
2993	95% H-UCL					1304	90% Chebyshev (MVUE) UCL					1356
2994	95% Chebyshev (MVUE) UCL					1414	97.5% Chebyshev (MVUE) UCL					1495
2995	99% Chebyshev (MVUE) UCL					1653						
2996												
2997	Nonparametric Distribution Free UCL Statistics											
2998	Data appear to follow a Discernible Distribution at 5% Significance Level											
2999												
3000	Nonparametric Distribution Free UCLs											
3001	95% CLT UCL					1281	95% Jackknife UCL					1281
3002	95% Standard Bootstrap UCL					1280	95% Bootstrap-t UCL					1282
3003	95% Hall's Bootstrap UCL					1283	95% Percentile Bootstrap UCL					1279
3004	95% BCA Bootstrap UCL					1284						
3005	90% Chebyshev(Mean, Sd) UCL					1331	95% Chebyshev(Mean, Sd) UCL					1381
3006	97.5% Chebyshev(Mean, Sd) UCL					1450	99% Chebyshev(Mean, Sd) UCL					1587
3007												
3008	Suggested UCL to Use											
3009	95% Student's-t UCL					1281						
3010												
3011	Conditions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3012	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
3013	Singh and Singh (2003). However, simulation results will not cover all Real World data sets											
3014	For additional insight the user may want to consult a statistician.											
3015												
3016												
3017	Manganese											
3018												
3019	General Statistics											
3020	Total Number of Observations					107	Number of Distinct Observations					96
3021							Number of Missing Observations					0
3022	Minimum					78.1	Mean					347.7
3023	Maximum					893	Median					319
3024	SD					161.8	Std. Error of Mean					15.6

	A	B	C	D	E	F	G	H	I	J	K	L
3025	Coefficient of Variation					0.46	Skewness					0.95
3026												
3027	Normal GOF Test											
3028	Shapiro Wilk Test Statistic					0.93	Shapiro Wilk GOF Test					
3029	5% Shapiro Wilk P Value					1.6242E	Data Not Normal at 5% Significance Level					
3030	Lilliefors Test Statistic					0.13	Lilliefors GOF Test					
3031	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level					
3032	Data Not Normal at 5% Significance Level											
3033												
3034	Assuming Normal Distribution											
3035	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
3036	95% Student's-t UCL					373.7	95% Adjusted-CLT UCL (Chen-1995)					375
3037							95% Modified-t UCL (Johnson-1978)					373.9
3038												
3039	Gamma GOF Test											
3040	A-D Test Statistic					0.45	Anderson-Darling Gamma GOF Test					
3041	5% A-D Critical Value					0.75	data appear Gamma Distributed at 5% Significance Level					
3042	K-S Test Statistic					0.07	Kolmogrov-Smirnov Gamma GOF Test					
3043	5% K-S Critical Value					0.08	data appear Gamma Distributed at 5% Significance Level					
3044	Detected data appear Gamma Distributed at 5% Significance Level											
3045												
3046	Gamma Statistics											
3047	k hat (MLE)					4.73	k star (bias corrected MLE)					4.60
3048	Theta hat (MLE)					73.4	Theta star (bias corrected MLE)					75.4
3049	nu hat (MLE)					1013	nu star (bias corrected)					986.4
3050	MLE Mean (bias corrected)					347.7	MLE Sd (bias corrected)					162
3051							Approximate Chi Square Value (0.05)					914.5
3052	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					913.6
3053												
3054	Assuming Gamma Distribution											
3055	Approximate Gamma UCL (use when n>=50)					375	Adjusted Gamma UCL (use when n<50)					375.4
3056												
3057	Lognormal GOF Test											
3058	Shapiro Wilk Test Statistic					0.97	Shapiro Wilk Lognormal GOF Test					
3059	5% Shapiro Wilk P Value					0.12	Data appear Lognormal at 5% Significance Level					
3060	Lilliefors Test Statistic					0.08	Lilliefors Lognormal GOF Test					
3061	5% Lilliefors Critical Value					0.08	Data appear Lognormal at 5% Significance Level					
3062	Data appear Lognormal at 5% Significance Level											
3063												
3064	Lognormal Statistics											
3065	Minimum of Logged Data					4.35	Mean of logged Data					5.74
3066	Maximum of Logged Data					6.79	SD of logged Data					0.48
3067												
3068	Assuming Lognormal Distribution											
3069	95% H-UCL					382.1	90% Chebyshev (MVUE) UCL					402
3070	95% Chebyshev (MVUE) UCL					425.5	97.5% Chebyshev (MVUE) UCL					458.1
3071	99% Chebyshev (MVUE) UCL					522.2						
3072												
3073	Nonparametric Distribution Free UCL Statistics											
3074	Data appear to follow a Discernible Distribution at 5% Significance Level											
3075												
3076	Nonparametric Distribution Free UCLs											
3077	95% CLT UCL					373.4	95% Jackknife UCL					373.7
3078	95% Standard Bootstrap UCL					373.4	95% Bootstrap-t UCL					376.4
3079	95% Hall's Bootstrap UCL					375.6	95% Percentile Bootstrap UCL					372.7
3080	95% BCA Bootstrap UCL					374.1						
3081	90% Chebyshev(Mean, Sd) UCL					394.6	95% Chebyshev(Mean, Sd) UCL					415.9
3082	97.5% Chebyshev(Mean, Sd) UCL					445.4	99% Chebyshev(Mean, Sd) UCL					503.3
3083												
3084	Suggested UCL to Use											
3085	95% Approximate Gamma UCL					375						
3086												
3087	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											

	A	B	C	D	E	F	G	H	I	J	K	L
3088	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
3089	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
3090	For additional insight the user may want to consult a statistician.											
3091												
3092	Mercury											
3093												
3094	General Statistics											
3095	Total Number of Observations				107		Number of Distinct Observations				103	
3096	Number of Detects				104		Number of Non-Detects				3	
3097	Number of Distinct Detects				100		Number of Distinct Non-Detects				3	
3098	Minimum Detect				0.005		Minimum Non-Detect				0.009	
3099	Maximum Detect				25		Maximum Non-Detect				0.03	
3100	Variance Detects				13.34		Percent Non-Detects				2.80	
3101	Mean Detects				0.84		SD Detects				3.65	
3102	Median Detects				0.04		CV Detects				4.30	
3103	Skewness Detects				5.49		Kurtosis Detects				30.8	
3104	Mean of Logged Detects				-2.64		SD of Logged Detects				1.67	
3105												
3106	Normal GOF Test on Detects Only											
3107	Shapiro Wilk Test Statistic				0.25		Normal GOF Test on Detected Observations Only					
3108	5% Shapiro Wilk P Value				0		Detected Data Not Normal at 5% Significance Level					
3109	Lilliefors Test Statistic				0.43		Lilliefors GOF Test					
3110	5% Lilliefors Critical Value				0.08		Detected Data Not Normal at 5% Significance Level					
3111	Detected Data Not Normal at 5% Significance Level											
3112												
3113	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3114	Mean				0.82		Standard Error of Mean				0.34	
3115	SD				3.58		95% KM (BCA) UCL				1.51	
3116	95% KM (t) UCL				1.40		95% KM (Percentile Bootstrap) UCL				1.45	
3117	95% KM (z) UCL				1.39		95% KM Bootstrap t UCL				2.07	
3118	90% KM Chebyshev UCL				1.87		95% KM Chebyshev UCL				2.34	
3119	97.5% KM Chebyshev UCL				3		99% KM Chebyshev UCL				4.29	
3120												
3121	Gamma GOF Tests on Detected Observations Only											
3122	A-D Test Statistic				17.0		Anderson-Darling GOF Test					
3123	5% A-D Critical Value				0.87		Detected Data Not Gamma Distributed at 5% Significance Level					
3124	K-S Test Statistic				0.31		Kolmogorov-Smirnoff GOF					
3125	5% K-S Critical Value				0.09		Detected Data Not Gamma Distributed at 5% Significance Level					
3126	Detected Data Not Gamma Distributed at 5% Significance Level											
3127												
3128	Gamma Statistics on Detected Data Only											
3129	k hat (MLE)				0.28		k star (bias corrected MLE)				0.27	
3130	Theta hat (MLE)				3.01		Theta star (bias corrected MLE)				3.03	
3131	nu hat (MLE)				58.4		nu star (bias corrected)				58.0	
3132	MLE Mean (bias corrected)				0.84		MLE Sd (bias corrected)				1.60	
3133												
3134	Gamma Kaplan-Meier (KM) Statistics											
3135	k hat (KM)				0.05		nu hat (KM)				11.3	
3136	Approximate Chi Square Value (11.31, α)				4.77		Adjusted Chi Square Value (11.31, β)				4.71	
3137	Approximate KM-UCL (use when $n \geq 50$)				1.95		Gamma Adjusted KM-UCL (use when $n < 50$)				1.97	
3138	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3139												
3140	Gamma ROS Statistics using Imputed Non-Detects											
3141	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
3142	GROS may not be used when kstar of detected data is small such as < 0.1											
3143	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3144	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
3145	Minimum				0.005		Mean				0.82	
3146	Maximum				25		Median				0.04	
3147	SD				3.60		CV				4.37	
3148	k hat (MLE)				0.27		k star (bias corrected MLE)				0.27	
3149	Theta hat (MLE)				2.96		Theta star (bias corrected MLE)				2.98	
3150	nu hat (MLE)				59.5		nu star (bias corrected)				59.2	

	A	B	C	D	E	F	G	H	I	J	K	L
3151	MLE Mean (bias corrected)					0.82	MLE Sd (bias corrected)					1.56
3152							Adjusted Level of Significance (β)					0.04
3153	Approximate Chi Square Value (59.21, α)					42.5	Adjusted Chi Square Value (59.21, β)					42.3
3154	Gamma Approximate UCL (use when $n \geq 50$)					1.14	Gamma Adjusted UCL (use when $n < 50$)					1.15
3155												
3156	Lognormal GOF Test on Detected Observations Only											
3157	Lilliefors Test Statistic					0.14	Lilliefors GOF Test					
3158	5% Lilliefors Critical Value					0.08	Detected Data Not Lognormal at 5% Significance Level					
3159	Detected Data Not Lognormal at 5% Significance Level											
3160												
3161	Lognormal ROS Statistics Using Imputed Non-Detects											
3162	Mean in Original Scale					0.82	Mean in Log Scale					-2.71
3163	SD in Original Scale					3.60	SD in Log Scale					1.70
3164	95% t UCL (assumes normality of ROS data)					1.40	95% Percentile Bootstrap UCL					1.42
3165	95% BCA Bootstrap UCL					1.68	95% Bootstrap t UCL					2.09
3166	95% H-UCL (Log ROS)					0.46						
3167												
3168	DL/2 Statistics											
3169	DL/2 Normal						DL/2 Log-Transformed					
3170	Mean in Original Scale					0.82	Mean in Log Scale					-2.70
3171	SD in Original Scale					3.60	SD in Log Scale					1.69
3172	95% t UCL (Assumes normality)					1.40	95% H-Stat UCL					0.45
3173	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3174												
3175	Nonparametric Distribution Free UCL Statistics											
3176	Data do not follow a Discernible Distribution at 5% Significance Level											
3177												
3178	Suggested UCL to Use											
3179	97.5% KM (Chebyshev) UCL					3						
3180												
3181	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3182	Recommendations are based upon data size, data distribution, and skewness.											
3183	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3184	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
3185												
3186	Methylene Chloride											
3187												
3188	General Statistics											
3189	Total Number of Observations					107	Number of Distinct Observations					93
3190	Number of Detects					8	Number of Non-Detects					99
3191	Number of Distinct Detects					8	Number of Distinct Non-Detects					86
3192	Minimum Detect					0.002	Minimum Non-Detect					0.005
3193	Maximum Detect					0.005	Maximum Non-Detect					0.01
3194	Variance Detects					1.1493E	Percent Non-Detects					92.5
3195	Mean Detects					0.003	SD Detects					0.001
3196	Median Detects					0.003	CV Detects					0.29
3197	Skewness Detects					1.19	Kurtosis Detects					0.90
3198	Mean of Logged Detects					-5.65	SD of Logged Detects					0.27
3199												
3200	Normal GOF Test on Detects Only											
3201	Shapiro Wilk Test Statistic					0.88	Shapiro Wilk GOF Test					
3202	5% Shapiro Wilk Critical Value					0.81	Detected Data appear Normal at 5% Significance Level					
3203	Lilliefors Test Statistic					0.19	Lilliefors GOF Test					
3204	5% Lilliefors Critical Value					0.31	Detected Data appear Normal at 5% Significance Level					
3205	Detected Data appear Normal at 5% Significance Level											
3206												
3207	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3208	Mean					0.003	Standard Error of Mean					2.6744E
3209	SD					7.5245E	95% KM (BCA) UCL					0.003
3210	95% KM (t) UCL					0.003	95% KM (Percentile Bootstrap) UCL					0.003
3211	95% KM (z) UCL					0.003	95% KM Bootstrap t UCL					0.004
3212	90% KM Chebyshev UCL					0.004	95% KM Chebyshev UCL					0.004
3213	97.5% KM Chebyshev UCL					0.005	99% KM Chebyshev UCL					0.006

	A	B	C	D	E	F	G	H	I	J	K	L	
3214													
3215	Gamma GOF Tests on Detected Observations Only												
3216	A-D Test Statistic				0.32	Anderson-Darling GOF Test							
3217	5% A-D Critical Value				0.71	data appear Gamma Distributed at 5% Significance Level							
3218	K-S Test Statistic				0.17	Kolmogrov-Smirnoff GOF							
3219	5% K-S Critical Value				0.29	data appear Gamma Distributed at 5% Significance Level							
3220	Detected data appear Gamma Distributed at 5% Significance Level												
3221													
3222	Gamma Statistics on Detected Data Only												
3223	k hat (MLE)				14.71	k star (bias corrected MLE)				9.28			
3224	Theta hat (MLE)				2.4699E	Theta star (bias corrected MLE)				3.9164E			
3225	nu hat (MLE)				235.6	nu star (bias corrected)				148.6			
3226	MLE Mean (bias corrected)				0.003	MLE Sd (bias corrected)				0.001			
3227													
3228	Gamma Kaplan-Meier (KM) Statistics												
3229	k hat (KM)				20.41	nu hat (KM)				4369			
3230	Approximate Chi Square Value (N/A, α)				4216	Adjusted Chi Square Value (N/A, β)				4214			
3231	Approximate KM-UCL (use when n>=50)				0.003	Gamma Adjusted KM-UCL (use when n<50)				0.003			
3232													
3233	Gamma ROS Statistics using Imputed Non-Detects												
3234	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
3235	GROS may not be used when kstar of detected data is small such as < 0.1												
3236	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
3237	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
3238	Minimum				0.002	Mean				0.009			
3239	Maximum				0.01	Median				0.01			
3240	SD				0.001	CV				0.17			
3241	k hat (MLE)				17.11	k star (bias corrected MLE)				16.61			
3242	Theta hat (MLE)				5.5537E	Theta star (bias corrected MLE)				5.7118E			
3243	nu hat (MLE)				3670	nu star (bias corrected)				3568			
3244	MLE Mean (bias corrected)				0.009	MLE Sd (bias corrected)				0.002			
3245						Adjusted Level of Significance (β)				0.04			
3246	Approximate Chi Square Value (N/A, α)				3431	Adjusted Chi Square Value (N/A, β)				3429			
3247	Gamma Approximate UCL (use when n>=50)				0.009	Gamma Adjusted UCL (use when n<50)				0.009			
3248													
3249	Lognormal GOF Test on Detected Observations Only												
3250	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test							
3251	5% Shapiro Wilk Critical Value				0.81	Detected Data appear Lognormal at 5% Significance Level							
3252	Lilliefors Test Statistic				0.15	Lilliefors GOF Test							
3253	5% Lilliefors Critical Value				0.31	Detected Data appear Lognormal at 5% Significance Level							
3254	Detected Data appear Lognormal at 5% Significance Level												
3255													
3256	Lognormal ROS Statistics Using Imputed Non-Detects												
3257	Mean in Original Scale				0.003	Mean in Log Scale				-5.71			
3258	SD in Original Scale				3.3874E	SD in Log Scale				0.08			
3259	95% t UCL (assumes normality of ROS data)				0.003	95% Percentile Bootstrap UCL				0.003			
3260	95% BCA Bootstrap UCL				0.003	95% Bootstrap t UCL				0.003			
3261	95% H-UCL (Log ROS)				N/A								
3262													
3263	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
3264	KM Mean (logged)				-5.70	95% H-UCL (KM -Log)				0.003			
3265	KM SD (logged)				0.20	95% Critical H Value (KM-Log)				1.7			
3266	KM Standard Error of Mean (logged)				0.07								
3267													
3268	DL/2 Statistics												
3269	DL/2 Normal					DL/2 Log-Transformed							
3270	Mean in Original Scale				0.003	Mean in Log Scale				-5.75			
3271	SD in Original Scale				5.1908E	SD in Log Scale				0.14			
3272	95% t UCL (Assumes normality)				0.003	95% H-Stat UCL				0.003			
3273	DL/2 is not a recommended method, provided for comparisons and historical reasons												
3274													
3275	Nonparametric Distribution Free UCL Statistics												
3276	Detected Data appear Normal Distributed at 5% Significance Level												

	A	B	C	D	E	F	G	H	I	J	K	L
3277												
3278	Suggested UCL to Use											
3279	95% KM (t) UCL				0.003	95% KM (Percentile Bootstrap) UCL				0.003		
3280												
3281	tions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3282	Recommendations are based upon data size, data distribution, and skewness.											
3283	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3284	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
3285												
3286	Methylnaphthalene[2-]											
3287												
3288	General Statistics											
3289	Total Number of Observations				107	Number of Distinct Observations				95		
3290	Number of Detects				11	Number of Non-Detects				96		
3291	Number of Distinct Detects				11	Number of Distinct Non-Detects				84		
3292	Minimum Detect				0.01	Minimum Non-Detect				0.03		
3293	Maximum Detect				1.3	Maximum Non-Detect				1.81		
3294	Variance Detects				0.13	Percent Non-Detects				89.7%		
3295	Mean Detects				0.20	SD Detects				0.37		
3296	Median Detects				0.11	CV Detects				1.81		
3297	Skewness Detects				3.06	Kurtosis Detects				9.79		
3298	Mean of Logged Detects				-2.51	SD of Logged Detects				1.36		
3299												
3300	Normal GOF Test on Detects Only											
3301	Shapiro Wilk Test Statistic				0.52	Shapiro Wilk GOF Test						
3302	5% Shapiro Wilk Critical Value				0.85	Detected Data Not Normal at 5% Significance Level						
3303	Lilliefors Test Statistic				0.40	Lilliefors GOF Test						
3304	5% Lilliefors Critical Value				0.26	Detected Data Not Normal at 5% Significance Level						
3305	Detected Data Not Normal at 5% Significance Level											
3306												
3307	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3308	Mean				0.04	Standard Error of Mean				0.01		
3309	SD				0.12	95% KM (BCA) UCL				0.06		
3310	95% KM (t) UCL				0.06	95% KM (Percentile Bootstrap) UCL				0.06		
3311	95% KM (z) UCL				0.06	95% KM Bootstrap t UCL				0.11		
3312	90% KM Chebyshev UCL				0.08	95% KM Chebyshev UCL				0.09		
3313	97.5% KM Chebyshev UCL				0.12	99% KM Chebyshev UCL				0.17		
3314												
3315	Gamma GOF Tests on Detected Observations Only											
3316	A-D Test Statistic				0.85	Anderson-Darling GOF Test						
3317	5% A-D Critical Value				0.77	Detected Data Not Gamma Distributed at 5% Significance Level						
3318	K-S Test Statistic				0.24	Kolmogorov-Smirnov GOF						
3319	5% K-S Critical Value				0.26	Detected data appear Gamma Distributed at 5% Significance Level						
3320	Detected data follow Appr. Gamma Distribution at 5% Significance Level											
3321												
3322	Gamma Statistics on Detected Data Only											
3323	k hat (MLE)				0.65	k star (bias corrected MLE)				0.53		
3324	Theta hat (MLE)				0.31	Theta star (bias corrected MLE)				0.38		
3325	nu hat (MLE)				14.4	nu star (bias corrected)				11.8		
3326	MLE Mean (bias corrected)				0.20	MLE Sd (bias corrected)				0.27		
3327												
3328	Gamma Kaplan-Meier (KM) Statistics											
3329	k hat (KM)				0.11	nu hat (KM)				23.9		
3330	Approximate Chi Square Value (23.97, α)				13.8	Adjusted Chi Square Value (23.97, β)				13.7		
3331	Approximate KM-UCL (use when $n \geq 50$)				0.07	Gamma Adjusted KM-UCL (use when $n < 50$)				0.07		
3332												
3333	Gamma ROS Statistics using Imputed Non-Detects											
3334	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3335	GROS may not be used when kstar of detected data is small such as < 0.1											
3336	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3337	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
3338	Minimum				0.01	Mean				0.03		
3339	Maximum				1.3	Median				0.01		

	A	B	C	D	E	F	G	H	I	J	K	L
3340					SD	0.12					CV	4.28
3341					k hat (MLE)	0.68					k star (bias corrected MLE)	0.67
3342					Theta hat (MLE)	0.04					Theta star (bias corrected MLE)	0.04
3343					nu hat (MLE)	146.6					nu star (bias corrected)	143.8
3344					MLE Mean (bias corrected)	0.03					MLE Sd (bias corrected)	0.03
3345											Adjusted Level of Significance (β)	0.04
3346					Approximate Chi Square Value (143.84, α)	117.1					Adjusted Chi Square Value (143.84, β)	116.8
3347					Gamma Approximate UCL (use when n>=50)	0.036					Gamma Adjusted UCL (use when n<50)	0.03
3348												
3349					Lognormal GOF Test on Detected Observations Only							
3350					Shapiro Wilk Test Statistic	0.88					Shapiro Wilk GOF Test	
3351					5% Shapiro Wilk Critical Value	0.85					Detected Data appear Lognormal at 5% Significance Level	
3352					Lilliefors Test Statistic	0.20					Lilliefors GOF Test	
3353					5% Lilliefors Critical Value	0.26					Detected Data appear Lognormal at 5% Significance Level	
3354					Detected Data appear Lognormal at 5% Significance Level							
3355												
3356					Lognormal ROS Statistics Using Imputed Non-Detects							
3357					Mean in Original Scale	0.04					Mean in Log Scale	-3.57
3358					SD in Original Scale	0.12					SD in Log Scale	0.59
3359					95% t UCL (assumes normality of ROS data)	0.06					95% Percentile Bootstrap UCL	0.06
3360					95% BCA Bootstrap UCL	0.08					95% Bootstrap t UCL	0.13
3361					95% H-UCL (Log ROS)	0.03						
3362												
3363					Estimates using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed							
3364					KM Mean (logged)	-3.64					95% H-UCL (KM -Log)	0.03
3365					KM SD (logged)	0.60					95% Critical H Value (KM-Log)	1.89
3366					KM Standard Error of Mean (logged)	0.10						
3367												
3368					DL/2 Statistics							
3369					DL/2 Normal				DL/2 Log-Transformed			
3370					Mean in Original Scale	0.05					Mean in Log Scale	-3.48
3371					SD in Original Scale	0.15					SD in Log Scale	0.79
3372					95% t UCL (Assumes normality)	0.08					95% H-Stat UCL	0.04
3373					DL/2 is not a recommended method, provided for comparisons and historical reasons							
3374												
3375					Nonparametric Distribution Free UCL Statistics							
3376					Detected Data appear Approximate Gamma Distributed at 5% Significance Level							
3377												
3378					Suggested UCL to Use							
3379					95% KM (t) UCL	0.06					95% GROS Approximate Gamma UCL	0.03
3380					95% Approximate Gamma KM-UCL	0.07						
3381												
3382					Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate							
3383					Recommendations are based upon data size, data distribution, and skewness.							
3384					Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and							
3385					Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult							
3386												
3387					Naphthalene							
3388												
3389					General Statistics							
3390					Total Number of Observations	107					Number of Distinct Observations	94
3391					Number of Detects	11					Number of Non-Detects	96
3392					Number of Distinct Detects	11					Number of Distinct Non-Detects	84
3393					Minimum Detect	0.03					Minimum Non-Detect	0.03
3394					Maximum Detect	2.67					Maximum Non-Detect	1.81
3395					Variance Detects	0.58					Percent Non-Detects	89.7
3396					Mean Detects	0.39					SD Detects	0.76
3397					Median Detects	0.16					CV Detects	1.91
3398					Skewness Detects	3.13					Kurtosis Detects	10.0
3399					Mean of Logged Detects	-1.87					SD of Logged Detects	1.34
3400												
3401					Normal GOF Test on Detects Only							
3402					Shapiro Wilk Test Statistic	0.50					Shapiro Wilk GOF Test	

A	B	C	D	E	F	G	H	I	J	K	L
3403	5% Shapiro Wilk Critical Value				0.85	Detected Data Not Normal at 5% Significance Level					
3404	Lilliefors Test Statistic				0.40	Lilliefors GOF Test					
3405	5% Lilliefors Critical Value				0.26	Detected Data Not Normal at 5% Significance Level					
3406	Detected Data Not Normal at 5% Significance Level										
3407											
3408	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs										
3409	Mean				0.07	Standard Error of Mean				0.02	
3410	SD				0.25	95% KM (BCA) UCL				0.12	
3411	95% KM (t) UCL				0.11	95% KM (Percentile Bootstrap) UCL				0.12	
3412	95% KM (z) UCL				0.11	95% KM Bootstrap t UCL				0.25	
3413	90% KM Chebyshev UCL				0.14	95% KM Chebyshev UCL				0.18	
3414	97.5% KM Chebyshev UCL				0.23	99% KM Chebyshev UCL				0.33	
3415											
3416	Gamma GOF Tests on Detected Observations Only										
3417	A-D Test Statistic				0.81	Anderson-Darling GOF Test					
3418	5% A-D Critical Value				0.77	Detected Data Not Gamma Distributed at 5% Significance Level					
3419	K-S Test Statistic				0.23	Kolmogrov-Smirnoff GOF					
3420	5% K-S Critical Value				0.26	Detected Data appear Gamma Distributed at 5% Significance Level					
3421	Detected data follow Appr. Gamma Distribution at 5% Significance Level										
3422											
3423	Gamma Statistics on Detected Data Only										
3424	k hat (MLE)				0.64	k star (bias corrected MLE)				0.52	
3425	Theta hat (MLE)				0.62	Theta star (bias corrected MLE)				0.75	
3426	nu hat (MLE)				14.1	nu star (bias corrected)				11.6	
3427	MLE Mean (bias corrected)				0.39	MLE Sd (bias corrected)				0.55	
3428											
3429	Gamma Kaplan-Meier (KM) Statistics										
3430	k hat (KM)				0.07	nu hat (KM)				15.6	
3431	Approximate Chi Square Value (15.65, α)				7.71	Adjusted Chi Square Value (15.65, β)				7.64	
3432	Approximate KM-UCL (use when $n \geq 50$)				0.14	Gamma Adjusted KM-UCL (use when $n < 50$)				0.14	
3433	Gamma (KM) may not be used when k hat (KM) is < 0.1										
3434											
3435	Gamma ROS Statistics using Imputed Non-Detects										
3436	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs										
3437	GROS may not be used when kstar of detected data is small such as < 0.1										
3438	For such situations, GROS method tends to yield inflated values of UCLs and BTVs										
3439	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
3440	Minimum				0.01	Mean				0.05	
3441	Maximum				2.67	Median				0.01	
3442	SD				0.26	CV				5.26	
3443	k hat (MLE)				0.48	k star (bias corrected MLE)				0.47	
3444	Theta hat (MLE)				0.10	Theta star (bias corrected MLE)				0.10	
3445	nu hat (MLE)				102.9	nu star (bias corrected)				101.3	
3446	MLE Mean (bias corrected)				0.05	MLE Sd (bias corrected)				0.07	
3447						Adjusted Level of Significance (β)				0.04	
3448	Approximate Chi Square Value (101.35, α)				79.1	Adjusted Chi Square Value (101.35, β)				78.8	
3449	Gamma Approximate UCL (use when $n \geq 50$)				0.06	Gamma Adjusted UCL (use when $n < 50$)				0.06	
3450											
3451	Lognormal GOF Test on Detected Observations Only										
3452	Shapiro Wilk Test Statistic				0.92	Shapiro Wilk GOF Test					
3453	5% Shapiro Wilk Critical Value				0.85	Detected Data appear Lognormal at 5% Significance Level					
3454	Lilliefors Test Statistic				0.14	Lilliefors GOF Test					
3455	5% Lilliefors Critical Value				0.26	Detected Data appear Lognormal at 5% Significance Level					
3456	Detected Data appear Lognormal at 5% Significance Level										
3457											
3458	Lognormal ROS Statistics Using Imputed Non-Detects										
3459	Mean in Original Scale				0.05	Mean in Log Scale				-4.24	
3460	SD in Original Scale				0.26	SD in Log Scale				0.95	
3461	95% t UCL (assumes normality of ROS data)				0.09	95% Percentile Bootstrap UCL				0.1	
3462	95% BCA Bootstrap UCL				0.13	95% Bootstrap t UCL				0.23	
3463	95% H-UCL (Log ROS)				0.02						
3464											
3465	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed										

	A	B	C	D	E	F	G	H	I	J	K	L
3466	KM Mean (logged)					-3.27	95% H-UCL (KM -Log)					0.05
3467	KM SD (logged)					0.63	95% Critical H Value (KM-Log)					1.91
3468	KM Standard Error of Mean (logged)					0.06						
3469												
3470	DL/2 Statistics											
3471	DL/2 Normal					DL/2 Log-Transformed						
3472	Mean in Original Scale					0.07	Mean in Log Scale					-3.42
3473	SD in Original Scale					0.27	SD in Log Scale					0.89
3474	95% t UCL (Assumes normality)					0.12	95% H-Stat UCL					0.05
3475	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3476												
3477	Nonparametric Distribution Free UCL Statistics											
3478	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
3479												
3480	Suggested UCL to Use											
3481	95% KM (t) UCL					0.11	95% GROS Approximate Gamma UCL					0.06
3482	95% Approximate Gamma KM-UCL					0.14						
3483												
3484	Directions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3485	Recommendations are based upon data size, data distribution, and skewness.											
3486	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3487	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
3488												
3489	Nickel											
3490												
3491	General Statistics											
3492	Total Number of Observations					107	Number of Distinct Observations					100
3493	Number of Detects					106	Number of Non-Detects					1
3494	Number of Distinct Detects					99	Number of Distinct Non-Detects					1
3495	Minimum Detect					2.41	Minimum Non-Detect					0.43
3496	Maximum Detect					53	Maximum Non-Detect					0.43
3497	Variance Detects					24.7	Percent Non-Detects					0.93
3498	Mean Detects					5.86	SD Detects					4.97
3499	Median Detects					5.24	CV Detects					0.84
3500	Skewness Detects					8.33	Kurtosis Detects					78.4
3501	Mean of Logged Detects					1.66	SD of Logged Detects					0.38
3502												
3503	Normal GOF Test on Detects Only											
3504	Shapiro Wilk Test Statistic					0.36	Normal GOF Test on Detected Observations Only					
3505	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
3506	Lilliefors Test Statistic					0.30	Lilliefors GOF Test					
3507	5% Lilliefors Critical Value					0.08	Detected Data Not Normal at 5% Significance Level					
3508	Detected Data Not Normal at 5% Significance Level											
3509												
3510	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3511	Mean					5.81	Standard Error of Mean					0.48
3512	SD					4.95	95% KM (BCA) UCL					6.79
3513	95% KM (t) UCL					6.61	95% KM (Percentile Bootstrap) UCL					6.63
3514	95% KM (z) UCL					6.60	95% KM Bootstrap t UCL					7.72
3515	90% KM Chebyshev UCL					7.25	95% KM Chebyshev UCL					7.91
3516	97.5% KM Chebyshev UCL					8.82	99% KM Chebyshev UCL					10.6
3517												
3518	Gamma GOF Tests on Detected Observations Only											
3519	A-D Test Statistic					5.48	Anderson-Darling GOF Test					
3520	5% A-D Critical Value					0.75	Detected Data Not Gamma Distributed at 5% Significance Level					
3521	K-S Test Statistic					0.18	Kolmogorov-Smirnoff GOF					
3522	5% K-S Critical Value					0.08	Detected Data Not Gamma Distributed at 5% Significance Level					
3523	Detected Data Not Gamma Distributed at 5% Significance Level											
3524												
3525	Gamma Statistics on Detected Data Only											
3526	k hat (MLE)					4.87	k star (bias corrected MLE)					4.74
3527	Theta hat (MLE)					1.20	Theta star (bias corrected MLE)					1.23
3528	nu hat (MLE)					1034	nu star (bias corrected)					1006

	A	B	C	D	E	F	G	H	I	J	K	L
3529	MLE Mean (bias corrected)					5.86	MLE Sd (bias corrected)					2.69
3530												
3531	Gamma Kaplan-Meier (KM) Statistics											
3532	k hat (KM)					1.37	nu hat (KM)					294.9
3533	Approximate Chi Square Value (294.87, α)					256.1	Adjusted Chi Square Value (294.87, β)					255.6
3534	Approximate KM-UCL (use when $n \geq 50$)					6.69	Gamma Adjusted KM-UCL (use when $n < 50$)					6.70
3535												
3536	Gamma ROS Statistics using Imputed Non-Detects											
3537	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3538	GROS may not be used when kstar of detected data is small such as < 0.1											
3539	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3540	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate											
3541	Minimum					0.16	Mean					5.81
3542	Maximum					53	Median					5.15
3543	SD					4.98	CV					0.85
3544	k hat (MLE)					4.02	k star (bias corrected MLE)					3.91
3545	Theta hat (MLE)					1.44	Theta star (bias corrected MLE)					1.48
3546	nu hat (MLE)					860.8	nu star (bias corrected)					838
3547	MLE Mean (bias corrected)					5.81	MLE Sd (bias corrected)					2.93
3548							Adjusted Level of Significance (β)					0.04
3549	Approximate Chi Square Value (838.04, α)					771.9	Adjusted Chi Square Value (838.04, β)					771
3550	Gamma Approximate UCL (use when $n \geq 50$)					6.31	Gamma Adjusted UCL (use when $n < 50$)					6.31
3551												
3552	Lognormal GOF Test on Detected Observations Only											
3553	Lilliefors Test Statistic					0.11	Lilliefors GOF Test					
3554	5% Lilliefors Critical Value					0.086	Detected Data Not Lognormal at 5% Significance Level					
3555	Detected Data Not Lognormal at 5% Significance Level											
3556												
3557	Lognormal ROS Statistics Using Imputed Non-Detects											
3558	Mean in Original Scale					5.83	Mean in Log Scale					1.65
3559	SD in Original Scale					4.96	SD in Log Scale					0.38
3560	95% t UCL (assumes normality of ROS data)					6.62	95% Percentile Bootstrap UCL					6.72
3561	95% BCA Bootstrap UCL					7.65	95% Bootstrap t UCL					7.86
3562	95% H-UCL (Log ROS)					6.03						
3563												
3564	DL/2 Statistics											
3565	DL/2 Normal						DL/2 Log-Transformed					
3566	Mean in Original Scale					5.81	Mean in Log Scale					1.63
3567	SD in Original Scale					4.97	SD in Log Scale					0.48
3568	95% t UCL (Assumes normality)					6.61	95% H-Stat UCL					6.29
3569	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3570												
3571	Nonparametric Distribution Free UCL Statistics											
3572	Data do not follow a Discernible Distribution at 5% Significance Level											
3573												
3574	Suggested UCL to Use											
3575	95% KM (BCA) UCL					6.79						
3576												
3577	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3578	Recommendations are based upon data size, data distribution, and skewness.											
3579	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3580	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
3581												
3582	Phenanthrene											
3583												
3584	General Statistics											
3585	Total Number of Observations					107	Number of Distinct Observations					99
3586	Number of Detects					54	Number of Non-Detects					53
3587	Number of Distinct Detects					52	Number of Distinct Non-Detects					51
3588	Minimum Detect					0.01	Minimum Non-Detect					0.03
3589	Maximum Detect					85.7	Maximum Non-Detect					0.40
3590	Variance Detects					138.1	Percent Non-Detects					49.5
3591	Mean Detects					2.60	SD Detects					11.7

	A	B	C	D	E	F	G	H	I	J	K	L
3592	Median Detects					0.13	CV Detects					4.51
3593	Skewness Detects					6.93	Kurtosis Detects					49.65
3594	Mean of Logged Detects					-1.61	SD of Logged Detects					2.05
3595												
3596	Normal GOF Test on Detects Only											
3597	Shapiro Wilk Test Statistic					0.23	Normal GOF Test on Detected Observations Only					
3598	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
3599	Lilliefors Test Statistic					0.41	Lilliefors GOF Test					
3600	5% Lilliefors Critical Value					0.12	Detected Data Not Normal at 5% Significance Level					
3601	Detected Data Not Normal at 5% Significance Level											
3602												
3603	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3604	Mean					1.32	Standard Error of Mean					0.81
3605	SD					8.36	95% KM (BCA) UCL					2.99
3606	95% KM (t) UCL					2.68	95% KM (Percentile Bootstrap) UCL					2.90
3607	95% KM (z) UCL					2.66	95% KM Bootstrap t UCL					8.65
3608	90% KM Chebyshev UCL					3.77	95% KM Chebyshev UCL					4.88
3609	97.5% KM Chebyshev UCL					6.42	99% KM Chebyshev UCL					9.45
3610												
3611	Gamma GOF Tests on Detected Observations Only											
3612	A-D Test Statistic					5.28	Anderson-Darling GOF Test					
3613	5% A-D Critical Value					0.87	Detected Data Not Gamma Distributed at 5% Significance Level					
3614	K-S Test Statistic					0.23	Kolmogrov-Smirnoff GOF					
3615	5% K-S Critical Value					0.13	Detected Data Not Gamma Distributed at 5% Significance Level					
3616	Detected Data Not Gamma Distributed at 5% Significance Level											
3617												
3618	Gamma Statistics on Detected Data Only											
3619	k hat (MLE)					0.27	k star (bias corrected MLE)					0.26
3620	Theta hat (MLE)					9.55	Theta star (bias corrected MLE)					9.65
3621	nu hat (MLE)					29.4	nu star (bias corrected)					29.1
3622	MLE Mean (bias corrected)					2.60	MLE Sd (bias corrected)					5.01
3623												
3624	Gamma Kaplan-Meier (KM) Statistics											
3625	k hat (KM)					0.024	nu hat (KM)					5.36
3626	Approximate Chi Square Value (5.37, α)					1.32	Adjusted Chi Square Value (5.37, β)					1.29
3627	Approximate KM-UCL (use when $n \geq 50$)					5.36	Gamma Adjusted KM-UCL (use when $n < 50$)					5.47
3628	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3629												
3630	Gamma ROS Statistics using Imputed Non-Detects											
3631	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
3632	GROS may not be used when kstar of detected data is small such as < 0.1											
3633	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3634	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3635	Minimum					0.01	Mean					1.31
3636	Maximum					85.7	Median					0.01
3637	SD					8.41	CV					6.38
3638	k hat (MLE)					0.21	k star (bias corrected MLE)					0.21
3639	Theta hat (MLE)					6.11	Theta star (bias corrected MLE)					6.10
3640	nu hat (MLE)					46.14	nu star (bias corrected)					46.14
3641	MLE Mean (bias corrected)					1.31	MLE Sd (bias corrected)					2.83
3642							Adjusted Level of Significance (β)					0.04
3643	Approximate Chi Square Value (46.18, α)					31.5	Adjusted Chi Square Value (46.18, β)					31.4
3644	Gamma Approximate UCL (use when $n \geq 50$)					1.92	Gamma Adjusted UCL (use when $n < 50$)					1.93
3645												
3646	Lognormal GOF Test on Detected Observations Only											
3647	Lilliefors Test Statistic					0.094	Lilliefors GOF Test					
3648	5% Lilliefors Critical Value					0.12	Detected Data appear Lognormal at 5% Significance Level					
3649	Detected Data appear Approximate Lognormal at 5% Significance Level											
3650												
3651	Lognormal ROS Statistics Using Imputed Non-Detects											
3652	Mean in Original Scale					1.32	Mean in Log Scale					-2.69
3653	SD in Original Scale					8.40	SD in Log Scale					1.82
3654	95% t UCL (assumes normality of ROS data)					2.67	95% Percentile Bootstrap UCL					2.90

	A	B	C	D	E	F	G	H	I	J	K	L	
3655	95% BCA Bootstrap UCL					3.89	95% Bootstrap t UCL					8.35	
3656	95% H-UCL (Log ROS)					0.61							
3657													
3658	PLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
3659	KM Mean (logged)					-2.67	95% H-UCL (KM -Log)					0.62	
3660	KM SD (logged)					1.81	95% Critical H Value (KM-Log)					3.09	
3661	KM Standard Error of Mean (logged)					0.18							
3662													
3663	DL/2 Statistics												
3664	DL/2 Normal					DL/2 Log-Transformed							
3665	Mean in Original Scale					1.32	Mean in Log Scale					-2.64	
3666	SD in Original Scale					8.40	SD in Log Scale					1.81	
3667	95% t UCL (Assumes normality)					2.67	95% H-Stat UCL					0.64	
3668	DL/2 is not a recommended method, provided for comparisons and historical reasons												
3669													
3670	Nonparametric Distribution Free UCL Statistics												
3671	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level												
3672													
3673	Suggested UCL to Use												
3674	97.5% KM (Chebyshev) UCL					6.42							
3675													
3676	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
3677	Recommendations are based upon data size, data distribution, and skewness.												
3678	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
3679	ations results will not cover all Real World data sets; for additional insight the user may want to cons												
3680													
3681	Plutonium-239/240												
3682													
3683	General Statistics												
3684	Total Number of Observations					107	Number of Distinct Observations					100	
3685	Number of Detects					43	Number of Non-Detects					64	
3686	Number of Distinct Detects					40	Number of Distinct Non-Detects					60	
3687	Minimum Detect					0.01	Minimum Non-Detect					-0.004	
3688	Maximum Detect					0.09	Maximum Non-Detect					0.02	
3689	Variance Detects					3.6067E	Percent Non-Detects					59.8	
3690	Mean Detects					0.04	SD Detects					0.01	
3691	Median Detects					0.03	CV Detects					0.44	
3692	Skewness Detects					1.43	Kurtosis Detects					1.44	
3693													
3694	Normal GOF Test on Detects Only												
3695	Shapiro Wilk Test Statistic					0.83	Shapiro Wilk GOF Test						
3696	5% Shapiro Wilk Critical Value					0.94	Detected Data Not Normal at 5% Significance Level						
3697	Lilliefors Test Statistic					0.17	Lilliefors GOF Test						
3698	5% Lilliefors Critical Value					0.13	Detected Data Not Normal at 5% Significance Level						
3699	Detected Data Not Normal at 5% Significance Level												
3700													
3701	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
3702	Mean					0.01	Standard Error of Mean					0.002	
3703	SD					0.02	95% KM (BCA) UCL					0.02	
3704	95% KM (t) UCL					0.01	95% KM (Percentile Bootstrap) UCL					0.01	
3705	95% KM (z) UCL					0.01	95% KM Bootstrap t UCL					0.01	
3706	90% KM Chebyshev UCL					0.02	95% KM Chebyshev UCL					0.02	
3707	97.5% KM Chebyshev UCL					0.03	99% KM Chebyshev UCL					0.03	
3708													
3709	Gamma GOF Tests on Detected Observations Only												
3710	A-D Test Statistic					1.23	Anderson-Darling GOF Test						
3711	5% A-D Critical Value					0.75	ed Data Not Gamma Distributed at 5% Significanc						
3712	K-S Test Statistic					0.12	Kolmogrov-Smirnoff GOF						
3713	5% K-S Critical Value					0.13	d data appear Gamma Distributed at 5% Significan						
3714	Detected data follow Appr. Gamma Distribution at 5% Significance Level												
3715													
3716	Gamma Statistics on Detected Data Only												
3717	k hat (MLE)					6.29	k star (bias corrected MLE)					5.87	

	A	B	C	D	E	F	G	H	I	J	K	L
3718	Theta hat (MLE)					0.006	Theta star (bias corrected MLE)					0.007
3719	nu hat (MLE)					541.3	nu star (bias corrected)					504.9
3720	MLE Mean (bias corrected)					0.04	MLE Sd (bias corrected)					0.01
3721												
3722	Gamma Kaplan-Meier (KM) Statistics											
3723	k hat (KM)					0.30	nu hat (KM)					66.1
3724							Adjusted Level of Significance (β)					0.04
3725	Approximate Chi Square Value (66.19, α)					48.4	Adjusted Chi Square Value (66.19, β)					48.2
3726	Approximate KM-UCL (use when n>=50)					0.01	Gamma Adjusted KM-UCL (use when n<50)					0.01
3727												
3728	DL/2 Statistics											
3729	Mean in Original Scale					0.02	SD in Original Scale					0.02
3730	95% t UCL (Assumes normality)					0.02						
3731	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3732												
3733	Nonparametric Distribution Free UCL Statistics											
3734	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
3735												
3736	Suggested UCL to Use											
3737	95% KM (t) UCL					0.01	95% GROS Approximate Gamma UCL					N/A
3738	95% Approximate Gamma KM-UCL					0.01						
3739	Warning: One or more Recommended UCL(s) not available!											
3740												
3741	Instructions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3742	Recommendations are based upon data size, data distribution, and skewness.											
3743	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3744	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
3745												
3746	Pyrene											
3747												
3748	General Statistics											
3749	Total Number of Observations					107	Number of Distinct Observations					100
3750	Number of Detects					60	Number of Non-Detects					47
3751	Number of Distinct Detects					60	Number of Distinct Non-Detects					45
3752	Minimum Detect					0.01	Minimum Non-Detect					0.03
3753	Maximum Detect					75.6	Maximum Non-Detect					0.40
3754	Variance Detects					101.9	Percent Non-Detects					43.9
3755	Mean Detects					2.59	SD Detects					10.0
3756	Median Detects					0.11	CV Detects					3.88
3757	Skewness Detects					6.71	Kurtosis Detects					48.3
3758	Mean of Logged Detects					-1.59	SD of Logged Detects					2.16
3759												
3760	Normal GOF Test on Detects Only											
3761	Shapiro Wilk Test Statistic					0.28	Normal GOF Test on Detected Observations Only					
3762	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level					
3763	Lilliefors Test Statistic					0.39	Lilliefors GOF Test					
3764	5% Lilliefors Critical Value					0.11	Detected Data Not Normal at 5% Significance Level					
3765	Detected Data Not Normal at 5% Significance Level											
3766												
3767	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3768	Mean					1.46	Standard Error of Mean					0.74
3769	SD					7.60	95% KM (BCA) UCL					3.16
3770	95% KM (t) UCL					2.69	95% KM (Percentile Bootstrap) UCL					2.89
3771	95% KM (z) UCL					2.68	95% KM Bootstrap t UCL					5.92
3772	90% KM Chebyshev UCL					3.69	95% KM Chebyshev UCL					4.69
3773	97.5% KM Chebyshev UCL					6.09	99% KM Chebyshev UCL					8.84
3774												
3775	Gamma GOF Tests on Detected Observations Only											
3776	A-D Test Statistic					5.26	Anderson-Darling GOF Test					
3777	5% A-D Critical Value					0.87	Detected Data Not Gamma Distributed at 5% Significance Level					
3778	K-S Test Statistic					0.22	Kolmogorov-Smirnov GOF					
3779	5% K-S Critical Value					0.12	Detected Data Not Gamma Distributed at 5% Significance Level					
3780	Detected Data Not Gamma Distributed at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
3781												
3782	Gamma Statistics on Detected Data Only											
3783	k hat (MLE)				0.27		k star (bias corrected MLE)				0.27	
3784	Theta hat (MLE)				9.47		Theta star (bias corrected MLE)				9.56	
3785	nu hat (MLE)				32.9		nu star (bias corrected)				32.6	
3786	MLE Mean (bias corrected)				2.59		MLE Sd (bias corrected)				4.98	
3787												
3788	Gamma Kaplan-Meier (KM) Statistics											
3789	k hat (KM)				0.03		nu hat (KM)				7.98	
3790	Approximate Chi Square Value (7.99, α)				2.72		Adjusted Chi Square Value (7.99, β)				2.68	
3791	Approximate KM-UCL (use when $n \geq 50$)				4.30		Gamma Adjusted KM-UCL (use when $n < 50$)				4.36	
3792	Gamma (KM) may not be used when k hat (KM) is < 0.1											
3793												
3794	Gamma ROS Statistics using Imputed Non-Detects											
3795	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs											
3796	GROS may not be used when kstar of detected data is small such as < 0.1											
3797	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
3798	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
3799	Minimum				0.01		Mean				1.46	
3800	Maximum				75.6		Median				0.02	
3801	SD				7.63		CV				5.22	
3802	k hat (MLE)				0.22		k star (bias corrected MLE)				0.22	
3803	Theta hat (MLE)				6.64		Theta star (bias corrected MLE)				6.64	
3804	nu hat (MLE)				47.0		nu star (bias corrected)				47.0	
3805	MLE Mean (bias corrected)				1.46		MLE Sd (bias corrected)				3.11	
3806							Adjusted Level of Significance (β)				0.04	
3807	Approximate Chi Square Value (47.07, α)				32.3		Adjusted Chi Square Value (47.07, β)				32.1	
3808	Gamma Approximate UCL (use when $n \geq 50$)				2.12		Gamma Adjusted UCL (use when $n < 50$)				2.13	
3809												
3810	Lognormal GOF Test on Detected Observations Only											
3811	Lilliefors Test Statistic				0.13		Lilliefors GOF Test					
3812	5% Lilliefors Critical Value				0.11		Detected Data Not Lognormal at 5% Significance Level					
3813	Detected Data Not Lognormal at 5% Significance Level											
3814												
3815	Lognormal ROS Statistics Using Imputed Non-Detects											
3816	Mean in Original Scale				1.46		Mean in Log Scale				-2.60	
3817	SD in Original Scale				7.63		SD in Log Scale				1.99	
3818	95% t UCL (assumes normality of ROS data)				2.69		95% Percentile Bootstrap UCL				2.78	
3819	95% BCA Bootstrap UCL				3.77		95% Bootstrap t UCL				6.02	
3820	95% H-UCL (Log ROS)				1.01							
3821												
3822	DL/2 Statistics											
3823	DL/2 Normal						DL/2 Log-Transformed					
3824	Mean in Original Scale				1.47		Mean in Log Scale				-2.50	
3825	SD in Original Scale				7.63		SD in Log Scale				1.94	
3826	95% t UCL (Assumes normality)				2.69		95% H-Stat UCL				1.00	
3827	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3828												
3829	Nonparametric Distribution Free UCL Statistics											
3830	Data do not follow a Discernible Distribution at 5% Significance Level											
3831												
3832	Suggested UCL to Use											
3833	97.5% KM (Chebyshev) UCL				6.09							
3834												
3835	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.											
3836	Recommendations are based upon data size, data distribution, and skewness.											
3837	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Singh (2010).											
3838	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult the literature.											
3839												
3840	Silver											
3841												
3842	General Statistics											
3843	Total Number of Observations				107		Number of Distinct Observations				98	

	A	B	C	D	E	F	G	H	I	J	K	L	
3844	Number of Detects					58	Number of Non-Detects					49	
3845	Number of Distinct Detects					56	Number of Distinct Non-Detects					42	
3846	Minimum Detect					0.10	Minimum Non-Detect					0.22	
3847	Maximum Detect					348	Maximum Non-Detect					0.96	
3848	Variance Detects					6742	Percent Non-Detects					45.7	
3849	Mean Detects					28.4	SD Detects					82.1	
3850	Median Detects					0.26	CV Detects					2.88	
3851	Skewness Detects					3.07	Kurtosis Detects					8.55	
3852	Mean of Logged Detects					-0.33	SD of Logged Detects					2.35	
3853													
3854	Normal GOF Test on Detects Only												
3855	Shapiro Wilk Test Statistic					0.39	Normal GOF Test on Detected Observations Only						
3856	5% Shapiro Wilk P Value					0	Detected Data Not Normal at 5% Significance Level						
3857	Lilliefors Test Statistic					0.46	Lilliefors GOF Test						
3858	5% Lilliefors Critical Value					0.11	Detected Data Not Normal at 5% Significance Level						
3859	Detected Data Not Normal at 5% Significance Level												
3860													
3861	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs												
3862	Mean					15.5	Standard Error of Mean					6.00	
3863	SD					61.56	95% KM (BCA) UCL					26.5	
3864	95% KM (t) UCL					25.5	95% KM (Percentile Bootstrap) UCL					25.5	
3865	95% KM (z) UCL					25.4	95% KM Bootstrap t UCL					30.7	
3866	90% KM Chebyshev UCL					33.5	95% KM Chebyshev UCL					41.7	
3867	97.5% KM Chebyshev UCL					53.0	99% KM Chebyshev UCL					75.2	
3868													
3869	Gamma GOF Tests on Detected Observations Only												
3870	A-D Test Statistic					11.96	Anderson-Darling GOF Test						
3871	5% A-D Critical Value					0.91	Detected Data Not Gamma Distributed at 5% Significance Level						
3872	K-S Test Statistic					0.37	Kolmogorov-Smirnoff GOF						
3873	5% K-S Critical Value					0.13	Detected Data Not Gamma Distributed at 5% Significance Level						
3874	Detected Data Not Gamma Distributed at 5% Significance Level												
3875													
3876	Gamma Statistics on Detected Data Only												
3877	k hat (MLE)					0.2	k star (bias corrected MLE)					0.20	
3878	Theta hat (MLE)					142.5	Theta star (bias corrected MLE)					141.7	
3879	nu hat (MLE)					23.1	nu star (bias corrected)					23.3	
3880	MLE Mean (bias corrected)					28.4	MLE Sd (bias corrected)					63.5	
3881													
3882	Gamma Kaplan-Meier (KM) Statistics												
3883	k hat (KM)					0.06	nu hat (KM)					13.6	
3884	Approximate Chi Square Value (13.63, α)					6.31	Adjusted Chi Square Value (13.63, β)					6.24	
3885	Approximate KM-UCL (use when $n \geq 50$)					33.5	Gamma Adjusted KM-UCL (use when $n < 50$)					33.8	
3886	Gamma (KM) may not be used when k hat (KM) is < 0.1												
3887													
3888	Gamma ROS Statistics using Imputed Non-Detects												
3889	GROS may not be used when data set has $> 50\%$ NDs with many tied observations at multiple DLs												
3890	GROS may not be used when kstar of detected data is small such as < 0.1												
3891	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
3892	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimate												
3893	Minimum					0.01	Mean					15.4	
3894	Maximum					348	Median					0.13	
3895	SD					61.8	CV					4.00	
3896	k hat (MLE)					0.15	k star (bias corrected MLE)					0.15	
3897	Theta hat (MLE)					101.2	Theta star (bias corrected MLE)					99.9	
3898	nu hat (MLE)					32.6	nu star (bias corrected)					33.0	
3899	MLE Mean (bias corrected)					15.4	MLE Sd (bias corrected)					39.2	
3900							Adjusted Level of Significance (β)					0.04	
3901	Approximate Chi Square Value (33.05, α)					20.9	Adjusted Chi Square Value (33.05, β)					20.7	
3902	Gamma Approximate UCL (use when $n \geq 50$)					24.4	Gamma Adjusted UCL (use when $n < 50$)					24.5	
3903													
3904	Lognormal GOF Test on Detected Observations Only												
3905	Lilliefors Test Statistic					0.28	Lilliefors GOF Test						
3906	5% Lilliefors Critical Value					0.11	Detected Data Not Lognormal at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L
3907	Detected Data Not Lognormal at 5% Significance Level											
3908												
3909	Lognormal ROS Statistics Using Imputed Non-Detects											
3910	Mean in Original Scale					15.5	Mean in Log Scale					-0.71
3911	SD in Original Scale					61.8	SD in Log Scale					1.79
3912	95% t UCL (assumes normality of ROS data)					25.5	95% Percentile Bootstrap UCL					26.6
3913	95% BCA Bootstrap UCL					30.0	95% Bootstrap t UCL					30.6
3914	95% H-UCL (Log ROS)					4.20						
3915												
3916	DL/2 Statistics											
3917	DL/2 Normal						DL/2 Log-Transformed					
3918	Mean in Original Scale					15.5	Mean in Log Scale					-0.74
3919	SD in Original Scale					61.8	SD in Log Scale					1.79
3920	95% t UCL (Assumes normality)					25.4	95% H-Stat UCL					4.03
3921	DL/2 is not a recommended method, provided for comparisons and historical reasons											
3922												
3923	Nonparametric Distribution Free UCL Statistics											
3924	Data do not follow a Discernible Distribution at 5% Significance Level											
3925												
3926	Suggested UCL to Use											
3927	97.5% KM (Chebyshev) UCL					53.0						
3928												
3929	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
3930	Recommendations are based upon data size, data distribution, and skewness.											
3931	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
3932	Simulation results will not cover all Real World data sets; for additional insight the user may want to consult											
3933												
3934	Sodium											
3935												
3936	General Statistics											
3937	Total Number of Observations					107	Number of Distinct Observations					102
3938	Number of Detects					53	Number of Non-Detects					54
3939	Number of Distinct Detects					52	Number of Distinct Non-Detects					52
3940	Minimum Detect					42.7	Minimum Non-Detect					43.6
3941	Maximum Detect					1000	Maximum Non-Detect					121
3942	Variance Detects					35060	Percent Non-Detects					50.4
3943	Mean Detects					200.7	SD Detects					187.2
3944	Median Detects					113	CV Detects					0.93
3945	Skewness Detects					2.34	Kurtosis Detects					6.38
3946	Mean of Logged Detects					5.00	SD of Logged Detects					0.72
3947												
3948	Normal GOF Test on Detects Only											
3949	Shapiro Wilk Test Statistic					0.72	Normal GOF Test on Detected Observations Only					
3950	5% Shapiro Wilk P Value					1.655E-05	Detected Data Not Normal at 5% Significance Level					
3951	Lilliefors Test Statistic					0.22	Lilliefors GOF Test					
3952	5% Lilliefors Critical Value					0.12	Detected Data Not Normal at 5% Significance Level					
3953	Detected Data Not Normal at 5% Significance Level											
3954												
3955	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
3956	Mean					125.3	Standard Error of Mean					14.7
3957	SD					150.7	95% KM (BCA) UCL					153.9
3958	95% KM (t) UCL					149.8	95% KM (Percentile Bootstrap) UCL					149.9
3959	95% KM (z) UCL					149.6	95% KM Bootstrap t UCL					158.4
3960	90% KM Chebyshev UCL					169.6	95% KM Chebyshev UCL					189.7
3961	97.5% KM Chebyshev UCL					217.6	99% KM Chebyshev UCL					272.3
3962												
3963	Gamma GOF Tests on Detected Observations Only											
3964	A-D Test Statistic					2.26	Anderson-Darling GOF Test					
3965	5% A-D Critical Value					0.76	Detected Data Not Gamma Distributed at 5% Significance Level					
3966	K-S Test Statistic					0.19	Kolmogorov-Smirnov GOF					
3967	5% K-S Critical Value					0.12	Detected Data Not Gamma Distributed at 5% Significance Level					
3968	Detected Data Not Gamma Distributed at 5% Significance Level											
3969												

	A	B	C	D	E	F	G	H	I	J	K	L	
3970	Gamma Statistics on Detected Data Only												
3971	k hat (MLE)				1.84	k star (bias corrected MLE)				1.75			
3972	Theta hat (MLE)				108.6	Theta star (bias corrected MLE)				114.3			
3973	nu hat (MLE)				196	nu star (bias corrected)				186.2			
3974	MLE Mean (bias corrected)				200.7	MLE Sd (bias corrected)				151.4			
3975													
3976	Gamma Kaplan-Meier (KM) Statistics												
3977	k hat (KM)				0.69	nu hat (KM)				148.1			
3978	Approximate Chi Square Value (148.10, α)				121	Adjusted Chi Square Value (148.10, β)				120.6			
3979	Approximate KM-UCL (use when n>=50)				153.4	Gamma Adjusted KM-UCL (use when n<50)				153.9			
3980													
3981	Gamma ROS Statistics using Imputed Non-Detects												
3982	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
3983	GROS may not be used when kstar of detected data is small such as < 0.1												
3984	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
3985	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e												
3986	Minimum				0.01	Mean				99.4			
3987	Maximum				1000	Median				1.70			
3988	SD				165.4	CV				1.66			
3989	k hat (MLE)				0.17	k star (bias corrected MLE)				0.17			
3990	Theta hat (MLE)				579.9	Theta star (bias corrected MLE)				575.2			
3991	nu hat (MLE)				36.6	nu star (bias corrected)				36.9			
3992	MLE Mean (bias corrected)				99.4	MLE Sd (bias corrected)				239.1			
3993						Adjusted Level of Significance (β)				0.04			
3994	Approximate Chi Square Value (36.99, α)				24.0	Adjusted Chi Square Value (36.99, β)				23.9			
3995	Gamma Approximate UCL (use when n>=50)				152.8	Gamma Adjusted UCL (use when n<50)				153.7			
3996													
3997	Lognormal GOF Test on Detected Observations Only												
3998	Lilliefors Test Statistic				0.16	Lilliefors GOF Test							
3999	5% Lilliefors Critical Value				0.12	Detected Data Not Lognormal at 5% Significance Level							
4000	Detected Data Not Lognormal at 5% Significance Level												
4001													
4002	Lognormal ROS Statistics Using Imputed Non-Detects												
4003	Mean in Original Scale				116.9	Mean in Log Scale				4.26			
4004	SD in Original Scale				155.5	SD in Log Scale				0.91			
4005	95% t UCL (assumes normality of ROS data)				141.9	95% Percentile Bootstrap UCL				143.5			
4006	95% BCA Bootstrap UCL				146.1	95% Bootstrap t UCL				148.9			
4007	95% H-UCL (Log ROS)				129.7								
4008													
4009	DL/2 Statistics												
4010	DL/2 Normal					DL/2 Log-Transformed							
4011	Mean in Original Scale				118.9	Mean in Log Scale				4.31			
4012	SD in Original Scale				154.5	SD in Log Scale				0.87			
4013	95% t UCL (Assumes normality)				143.6	95% H-Stat UCL				130.3			
4014	DL/2 is not a recommended method, provided for comparisons and historical reasons												
4015													
4016	Nonparametric Distribution Free UCL Statistics												
4017	Data do not follow a Discernible Distribution at 5% Significance Level												
4018													
4019	Suggested UCL to Use												
4020	95% KM (t) UCL				149.8	95% KM (% Bootstrap) UCL				149.9			
4021													
4022	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
4023	Recommendations are based upon data size, data distribution, and skewness.												
4024	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
4025	Recommendations results will not cover all Real World data sets; for additional insight the user may want to cons												
4026													
4027	Toluene												
4028													
4029	General Statistics												
4030	Total Number of Observations				107	Number of Distinct Observations				66			
4031	Number of Detects				42	Number of Non-Detects				65			
4032	Number of Distinct Detects				39	Number of Distinct Non-Detects				30			

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	A	B	C	D	E	F	G	H	I	J	K	L
4096												
4097	Lognormal ROS Statistics Using Imputed Non-Detects											
4098	Mean in Original Scale				0.001	Mean in Log Scale				-7.19		
4099	SD in Original Scale				0.001	SD in Log Scale				0.62		
4100	95% t UCL (assumes normality of ROS data)				0.001	95% Percentile Bootstrap UCL				0.001		
4101	95% BCA Bootstrap UCL				0.001	95% Bootstrap t UCL				0.001		
4102	95% H-UCL (Log ROS)				0.001							
4103												
4104	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
4105	KM Mean (logged)				-7.24	95% H-UCL (KM -Log)				9.9766E		
4106	KM SD (logged)				0.65	95% Critical H Value (KM-Log)				1.92		
4107	KM Standard Error of Mean (logged)				0.08							
4108												
4109	DL/2 Statistics											
4110	DL/2 Normal					DL/2 Log-Transformed						
4111	Mean in Original Scale				9.8955E	Mean in Log Scale				-7.22		
4112	SD in Original Scale				0.001	SD in Log Scale				0.58		
4113	95% t UCL (Assumes normality)				0.001	95% H-Stat UCL				9.6328E		
4114	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4115												
4116	Nonparametric Distribution Free UCL Statistics											
4117	Detected Data appear Approximate Lognormal Distributed at 5% Significance Level											
4118												
4119	Suggested UCL to Use											
4120	95% KM (t) UCL				0.001	95% KM (% Bootstrap) UCL				0.001		
4121												
4122	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4123	Recommendations are based upon data size, data distribution, and skewness.											
4124	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
4125	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
4126												
4127	Trichloroethene											
4128												
4129	General Statistics											
4130	Total Number of Observations				107	Number of Distinct Observations				50		
4131	Number of Detects				7	Number of Non-Detects				100		
4132	Number of Distinct Detects				7	Number of Distinct Non-Detects				43		
4133	Minimum Detect				4.4800E	Minimum Non-Detect				0.001		
4134	Maximum Detect				9.0500E	Maximum Non-Detect				0.002		
4135	Variance Detects				2.1959E	Percent Non-Detects				93.4		
4136	Mean Detects				6.3614E	SD Detects				1.4819E		
4137	Median Detects				6.3200E	CV Detects				0.23		
4138	Skewness Detects				0.75	Kurtosis Detects				1.21		
4139	Mean of Logged Detects				-7.38	SD of Logged Detects				0.22		
4140												
4141	Normal GOF Test on Detects Only											
4142	Shapiro Wilk Test Statistic				0.94	Shapiro Wilk GOF Test						
4143	5% Shapiro Wilk Critical Value				0.80	Detected Data appear Normal at 5% Significance Level						
4144	Lilliefors Test Statistic				0.18	Lilliefors GOF Test						
4145	5% Lilliefors Critical Value				0.33	Detected Data appear Normal at 5% Significance Level						
4146	Detected Data appear Normal at 5% Significance Level											
4147												
4148	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4149	Mean				6.3614E	Standard Error of Mean				5.6010E		
4150	SD				1.3719E	95% KM (BCA) UCL				7.2817E		
4151	95% KM (t) UCL				7.2908E	95% KM (Percentile Bootstrap) UCL				7.3033E		
4152	95% KM (z) UCL				7.2827E	95% KM Bootstrap t UCL				7.6065E		
4153	90% KM Chebyshev UCL				8.0417E	95% KM Chebyshev UCL				8.8028E		
4154	97.5% KM Chebyshev UCL				9.8592E	99% KM Chebyshev UCL				0.001		
4155												
4156	Gamma GOF Tests on Detected Observations Only											
4157	A-D Test Statistic				0.22	Anderson-Darling GOF Test						
4158	5% A-D Critical Value				0.70	Detected data appear Gamma Distributed at 5% Significance Level						

	A	B	C	D	E	F	G	H	I	J	K	L	
4159	K-S Test Statistic					0.15	Kolmogrov-Smirnoff GOF						
4160	5% K-S Critical Value					0.31	Data appear Gamma Distributed at 5% Significance Level						
4161	Detected data appear Gamma Distributed at 5% Significance Level												
4162													
4163	Gamma Statistics on Detected Data Only												
4164	k hat (MLE)					22.24	k star (bias corrected MLE)					12.8	
4165	Theta hat (MLE)					2.8549E	Theta star (bias corrected MLE)					4.9590E	
4166	nu hat (MLE)					312	nu star (bias corrected)					179.6	
4167	MLE Mean (bias corrected)					6.3614E	MLE Sd (bias corrected)					1.7761E	
4168													
4169	Gamma Kaplan-Meier (KM) Statistics												
4170	k hat (KM)					21.5	nu hat (KM)					4601	
4171	Approximate Chi Square Value (N/A, α)					4444	Adjusted Chi Square Value (N/A, β)					4442	
4172	Approximate KM-UCL (use when $n \geq 50$)					6.5856E	Gamma Adjusted KM-UCL (use when $n < 50$)					6.5887E	
4173													
4174	Gamma ROS Statistics using Imputed Non-Detects												
4175	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs												
4176	GROS may not be used when kstar of detected data is small such as < 0.1												
4177	For such situations, GROS method tends to yield inflated values of UCLs and BTVs												
4178	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates												
4179	Minimum					4.4800E	Mean					0.009	
4180	Maximum					0.01	Median					0.01	
4181	SD					0.002	CV					0.24	
4182	k hat (MLE)					4.37	k star (bias corrected MLE)					4.26	
4183	Theta hat (MLE)					0.002	Theta star (bias corrected MLE)					0.002	
4184	nu hat (MLE)					937.2	nu star (bias corrected)					912.3	
4185	MLE Mean (bias corrected)					0.009	MLE Sd (bias corrected)					0.004	
4186							Adjusted Level of Significance (β)					0.04	
4187	Approximate Chi Square Value (912.26, α)					843.2	Adjusted Chi Square Value (912.26, β)					842.3	
4188	Gamma Approximate UCL (use when $n \geq 50$)					0.016	Gamma Adjusted UCL (use when $n < 50$)					0.01	
4189													
4190	Lognormal GOF Test on Detected Observations Only												
4191	Shapiro Wilk Test Statistic					0.97	Shapiro Wilk GOF Test						
4192	5% Shapiro Wilk Critical Value					0.80	Detected Data appear Lognormal at 5% Significance Level						
4193	Lilliefors Test Statistic					0.16	Lilliefors GOF Test						
4194	5% Lilliefors Critical Value					0.33	Detected Data appear Lognormal at 5% Significance Level						
4195	Detected Data appear Lognormal at 5% Significance Level												
4196													
4197	Lognormal ROS Statistics Using Imputed Non-Detects												
4198	Mean in Original Scale					6.2915E	Mean in Log Scale					-7.38	
4199	SD in Original Scale					9.6369E	SD in Log Scale					0.15	
4200	95% t UCL (assumes normality of ROS data)					6.4461E	95% Percentile Bootstrap UCL					6.4423E	
4201	95% BCA Bootstrap UCL					6.4451E	95% Bootstrap t UCL					6.4539E	
4202	95% H-UCL (Log ROS)					6.4514E							
4203													
4204	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed												
4205	KM Mean (logged)					-7.38	95% H-UCL (KM -Log)					6.5870E	
4206	KM SD (logged)					0.21	95% Critical H Value (KM-Log)					1.70	
4207	KM Standard Error of Mean (logged)					0.08							
4208													
4209	DL/2 Statistics												
4210	DL/2 Normal						DL/2 Log-Transformed						
4211	Mean in Original Scale					6.3330E	Mean in Log Scale					-7.37	
4212	SD in Original Scale					9.1330E	SD in Log Scale					0.13	
4213	95% t UCL (Assumes normality)					6.4795E	95% H-Stat UCL					6.4725E	
4214	DL/2 is not a recommended method, provided for comparisons and historical reasons												
4215													
4216	Nonparametric Distribution Free UCL Statistics												
4217	Detected Data appear Normal Distributed at 5% Significance Level												
4218													
4219	Suggested UCL to Use												
4220	95% KM (t) UCL					7.2908E	95% KM (Percentile Bootstrap) UCL					7.3033E	
4221													

A	B	C	D	E	F	G	H	I	J	K	L	
4222	tions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4223	Recommendations are based upon data size, data distribution, and skewness.											
4224	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
4225	Simulation results will not cover all Real World data sets; for additional insight the user may want to cons											
4226												
4227	Trimethylbenzene[1,2,4-]											
4228												
4229	General Statistics											
4230	Total Number of Observations				107	Number of Distinct Observations				51		
4231	Number of Detects				7	Number of Non-Detects				100		
4232	Number of Distinct Detects				6	Number of Distinct Non-Detects				45		
4233	Minimum Detect				3.8800E	Minimum Non-Detect				0.001		
4234	Maximum Detect				0.004	Maximum Non-Detect				0.002		
4235	Variance Detects				2.8196E	Percent Non-Detects				93.4		
4236	Mean Detects				0.001	SD Detects				0.001		
4237	Median Detects				4.5400E	CV Detects				1.37		
4238	Skewness Detects				2.53	Kurtosis Detects				6.52		
4239	Mean of Logged Detects				-7.18	SD of Logged Detects				0.91		
4240												
4241	Normal GOF Test on Detects Only											
4242	Shapiro Wilk Test Statistic				0.57	Shapiro Wilk GOF Test						
4243	5% Shapiro Wilk Critical Value				0.80	Detected Data Not Normal at 5% Significance Level						
4244	Lilliefors Test Statistic				0.41	Lilliefors GOF Test						
4245	5% Lilliefors Critical Value				0.33	Detected Data Not Normal at 5% Significance Level						
4246	Detected Data Not Normal at 5% Significance Level											
4247												
4248	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4249	Mean				6.3508E	Standard Error of Mean				1.1488E		
4250	SD				4.8714E	95% KM (BCA) UCL				8.4613E		
4251	95% KM (t) UCL				8.2572E	95% KM (Percentile Bootstrap) UCL				8.3371E		
4252	95% KM (z) UCL				8.2405E	95% KM Bootstrap t UCL				0.001		
4253	90% KM Chebyshev UCL				9.7973E	95% KM Chebyshev UCL				0.001		
4254	97.5% KM Chebyshev UCL				0.001	99% KM Chebyshev UCL				0.001		
4255												
4256	Gamma GOF Tests on Detected Observations Only											
4257	A-D Test Statistic				1.05	Anderson-Darling GOF Test						
4258	5% A-D Critical Value				0.72	Detected Data Not Gamma Distributed at 5% Significance Level						
4259	K-S Test Statistic				0.31	Kolmogorov-Smirnov GOF						
4260	5% K-S Critical Value				0.31	Detected data appear Gamma Distributed at 5% Significance Level						
4261	Detected data follow Appr. Gamma Distribution at 5% Significance Level											
4262												
4263	Gamma Statistics on Detected Data Only											
4264	k hat (MLE)				1.17	k star (bias corrected MLE)				0.76		
4265	Theta hat (MLE)				0.001	Theta star (bias corrected MLE)				0.001		
4266	nu hat (MLE)				16.4	nu star (bias corrected)				10.7		
4267	MLE Mean (bias corrected)				0.001	MLE Sd (bias corrected)				0.001		
4268												
4269	Gamma Kaplan-Meier (KM) Statistics											
4270	k hat (KM)				1.7	nu hat (KM)				363.7		
4271	Approximate Chi Square Value (363.72, α)				320.5	Adjusted Chi Square Value (363.72, β)				320		
4272	Approximate KM-UCL (use when $n \geq 50$)				7.2068E	Gamma Adjusted KM-UCL (use when $n < 50$)				7.2191E		
4273												
4274	Gamma ROS Statistics using Imputed Non-Detects											
4275	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
4276	GROS may not be used when kstar of detected data is small such as < 0.1											
4277	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
4278	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM e											
4279	Minimum				3.8800E	Mean				0.009		
4280	Maximum				0.01	Median				0.01		
4281	SD				0.002	CV				0.23		
4282	k hat (MLE)				4.71	k star (bias corrected MLE)				4.58		
4283	Theta hat (MLE)				0.002	Theta star (bias corrected MLE)				0.002		
4284	nu hat (MLE)				1008	nu star (bias corrected)				981		

	A	B	C	D	E	F	G	H	I	J	K	L
4285	MLE Mean (bias corrected)					0.009	MLE Sd (bias corrected)					0.004
4286							Adjusted Level of Significance (β)					0.04
4287	Approximate Chi Square Value (981.05, α)					909.3	Adjusted Chi Square Value (981.05, β)					908.4
4288	Gamma Approximate UCL (use when $n \geq 50$)					0.016	Gamma Adjusted UCL (use when $n < 50$)					0.016
4289												
4290	Lognormal GOF Test on Detected Observations Only											
4291	Shapiro Wilk Test Statistic					0.76	Shapiro Wilk GOF Test					
4292	5% Shapiro Wilk Critical Value					0.80	Detected Data Not Lognormal at 5% Significance Level					
4293	Lilliefors Test Statistic					0.28	Lilliefors GOF Test					
4294	5% Lilliefors Critical Value					0.33	Detected Data appear Lognormal at 5% Significance Level					
4295	Detected Data appear Approximate Lognormal at 5% Significance Level											
4296												
4297	Lognormal ROS Statistics Using Imputed Non-Detects											
4298	Mean in Original Scale					6.5613E	Mean in Log Scale					-7.44
4299	SD in Original Scale					4.8008E	SD in Log Scale					0.42
4300	95% t UCL (assumes normality of ROS data)					7.3315E	95% Percentile Bootstrap UCL					7.3721E
4301	95% BCA Bootstrap UCL					7.7887E	95% Bootstrap t UCL					8.0475E
4302	95% H-UCL (Log ROS)					6.9100E						
4303												
4304	Tests using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
4305	KM Mean (logged)					-7.48	95% H-UCL (KM -Log)					6.6490E
4306	KM SD (logged)					0.43	95% Critical H Value (KM-Log)					1.79
4307	KM Standard Error of Mean (logged)					0.16						
4308												
4309	DL/2 Statistics											
4310	DL/2 Normal						DL/2 Log-Transformed					
4311	Mean in Original Scale					6.7350E	Mean in Log Scale					-7.35
4312	SD in Original Scale					4.3338E	SD in Log Scale					0.25
4313	95% t UCL (Assumes normality)					7.4302E	95% H-Stat UCL					6.8657E
4314	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4315												
4316	Nonparametric Distribution Free UCL Statistics											
4317	Detected Data appear Approximate Gamma Distributed at 5% Significance Level											
4318												
4319	Suggested UCL to Use											
4320	95% KM (t) UCL					8.2572E	95% GROS Approximate Gamma UCL					0.016
4321	95% Approximate Gamma KM-UCL					7.2068E						
4322	Warning: Recommended UCL exceeds the maximum observation											
4323												
4324	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4325	Recommendations are based upon data size, data distribution, and skewness.											
4326	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
4327	Recommendations results will not cover all Real World data sets; for additional insight the user may want to consult											
4328												
4329	Tritium											
4330												
4331	General Statistics											
4332	Total Number of Observations					107	Number of Distinct Observations					107
4333	Number of Detects					13	Number of Non-Detects					94
4334	Number of Distinct Detects					13	Number of Distinct Non-Detects					94
4335	Minimum Detect					0.009	Minimum Non-Detect					-0.058
4336	Maximum Detect					0.98	Maximum Non-Detect					0.11
4337	Variance Detects					0.06	Percent Non-Detects					87.8
4338	Mean Detects					0.12	SD Detects					0.26
4339	Median Detects					0.03	CV Detects					2.17
4340	Skewness Detects					3.46	Kurtosis Detects					12.2
4341												
4342	Normal GOF Test on Detects Only											
4343	Shapiro Wilk Test Statistic					0.43	Shapiro Wilk GOF Test					
4344	5% Shapiro Wilk Critical Value					0.86	Detected Data Not Normal at 5% Significance Level					
4345	Lilliefors Test Statistic					0.39	Lilliefors GOF Test					
4346	5% Lilliefors Critical Value					0.24	Detected Data Not Normal at 5% Significance Level					
4347	Detected Data Not Normal at 5% Significance Level											

	A	B	C	D	E	F	G	H	I	J	K	L
4348												
4349	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4350			Mean	-0.034			Standard Error of Mean	0.014				
4351			SD	0.10			95% KM (BCA) UCL	0.014				
4352			95% KM (t) UCL	-0.016			95% KM (Percentile Bootstrap) UCL	-3.684E				
4353			95% KM (z) UCL	-0.016			95% KM Bootstrap t UCL	0.001				
4354			90% KM Chebyshev UCL	-0.002			95% KM Chebyshev UCL	0.012				
4355			97.5% KM Chebyshev UCL	0.032			99% KM Chebyshev UCL	0.072				
4356												
4357	Gamma GOF Tests on Detected Observations Only											
4358			A-D Test Statistic	1.33			Anderson-Darling GOF Test					
4359			5% A-D Critical Value	0.78			Detected Data Not Gamma Distributed at 5% Significance Level					
4360			K-S Test Statistic	0.25			Kolmogorov-Smirnoff GOF					
4361			5% K-S Critical Value	0.24			Detected Data Not Gamma Distributed at 5% Significance Level					
4362	Detected Data Not Gamma Distributed at 5% Significance Level											
4363												
4364	Gamma Statistics on Detected Data Only											
4365			k hat (MLE)	0.63			k star (bias corrected MLE)	0.53				
4366			Theta hat (MLE)	0.19			Theta star (bias corrected MLE)	0.22				
4367			nu hat (MLE)	16.4			nu star (bias corrected)	13.9				
4368			MLE Mean (bias corrected)	0.12			MLE Sd (bias corrected)	0.16				
4369												
4370	Gamma Kaplan-Meier (KM) Statistics											
4371			k hat (KM)	0.10			nu hat (KM)	22.7				
4372							Adjusted Level of Significance (β)	0.04				
4373			Approximate Chi Square Value (22.71, α)	12.8			Adjusted Chi Square Value (22.71, β)	12.7				
4374			Approximate KM-UCL (use when $n \geq 50$)	-0.06			Gamma Adjusted KM-UCL (use when $n < 50$)	-0.06				
4375												
4376	DL/2 Statistics											
4377			Mean in Original Scale	0.02			SD in Original Scale	0.09				
4378			95% t UCL (Assumes normality)	0.03								
4379	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4380												
4381	Nonparametric Distribution Free UCL Statistics											
4382	Data do not follow a Discernible Distribution at 5% Significance Level											
4383												
4384	Suggested UCL to Use											
4385			97.5% KM (Chebyshev) UCL	0.03								
4386												
4387	ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4388	Recommendations are based upon data size, data distribution, and skewness.											
4389	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
4390	ations results will not cover all Real World data sets; for additional insight the user may want to cons											
4391												
4392	Uranium											
4393												
4394	General Statistics											
4395			Total Number of Observations	107			Number of Distinct Observations	100				
4396			Number of Detects	106			Number of Non-Detects	1				
4397			Number of Distinct Detects	99			Number of Distinct Non-Detects	1				
4398			Minimum Detect	0.19			Minimum Non-Detect	0.04				
4399			Maximum Detect	10.4			Maximum Non-Detect	0.04				
4400			Variance Detects	2.08			Percent Non-Detects	0.93				
4401			Mean Detects	1.67			SD Detects	1.44				
4402			Median Detects	1.30			CV Detects	0.86				
4403			Skewness Detects	2.94			Kurtosis Detects	12.6				
4404			Mean of Logged Detects	0.26			SD of Logged Detects	0.67				
4405												
4406	Normal GOF Test on Detects Only											
4407			Shapiro Wilk Test Statistic	0.73			Normal GOF Test on Detected Observations Only					
4408			5% Shapiro Wilk P Value	0			Detected Data Not Normal at 5% Significance Level					
4409			Lilliefors Test Statistic	0.20			Lilliefors GOF Test					
4410			5% Lilliefors Critical Value	0.08			Detected Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
4411	Detected Data Not Normal at 5% Significance Level											
4412												
4413	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4414	Mean				1.65	Standard Error of Mean				0.14		
4415	SD				1.43	95% KM (BCA) UCL				1.89		
4416	95% KM (t) UCL				1.89	95% KM (Percentile Bootstrap) UCL				1.88		
4417	95% KM (z) UCL				1.88	95% KM Bootstrap t UCL				1.96		
4418	90% KM Chebyshev UCL				2.07	95% KM Chebyshev UCL				2.26		
4419	97.5% KM Chebyshev UCL				2.53	99% KM Chebyshev UCL				3.04		
4420												
4421	Gamma GOF Tests on Detected Observations Only											
4422	A-D Test Statistic				2.12	Anderson-Darling GOF Test						
4423	5% A-D Critical Value				0.76	Detected Data Not Gamma Distributed at 5% Significance Level						
4424	K-S Test Statistic				0.12	Kolmogorov-Smirnov GOF						
4425	5% K-S Critical Value				0.08	Detected Data Not Gamma Distributed at 5% Significance Level						
4426	Detected Data Not Gamma Distributed at 5% Significance Level											
4427												
4428	Gamma Statistics on Detected Data Only											
4429	k hat (MLE)				2.16	k star (bias corrected MLE)				2.11		
4430	Theta hat (MLE)				0.77	Theta star (bias corrected MLE)				0.79		
4431	nu hat (MLE)				459	nu star (bias corrected)				447.3		
4432	MLE Mean (bias corrected)				1.67	MLE Sd (bias corrected)				1.15		
4433												
4434	Gamma Kaplan-Meier (KM) Statistics											
4435	k hat (KM)				1.32	nu hat (KM)				284		
4436	Approximate Chi Square Value (284.05, α)				246	Adjusted Chi Square Value (284.05, β)				245.5		
4437	Approximate KM-UCL (use when $n \geq 50$)				1.91	Gamma Adjusted KM-UCL (use when $n < 50$)				1.91		
4438												
4439	Gamma ROS Statistics using Imputed Non-Detects											
4440	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
4441	GROS may not be used when kstar of detected data is small such as < 0.1											
4442	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
4443	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
4444	Minimum				0.01	Mean				1.65		
4445	Maximum				10.4	Median				1.3		
4446	SD				1.44	CV				0.87		
4447	k hat (MLE)				1.90	k star (bias corrected MLE)				1.86		
4448	Theta hat (MLE)				0.87	Theta star (bias corrected MLE)				0.89		
4449	nu hat (MLE)				408.1	nu star (bias corrected)				397.9		
4450	MLE Mean (bias corrected)				1.65	MLE Sd (bias corrected)				1.21		
4451						Adjusted Level of Significance (β)				0.04		
4452	Approximate Chi Square Value (397.95, α)				352.7	Adjusted Chi Square Value (397.95, β)				352.1		
4453	Gamma Approximate UCL (use when $n \geq 50$)				1.87	Gamma Adjusted UCL (use when $n < 50$)				1.87		
4454												
4455	Lognormal GOF Test on Detected Observations Only											
4456	Lilliefors Test Statistic				0.07	Lilliefors GOF Test						
4457	5% Lilliefors Critical Value				0.08	Detected Data appear Lognormal at 5% Significance Level						
4458	Detected Data appear Lognormal at 5% Significance Level											
4459												
4460	Lognormal ROS Statistics Using Imputed Non-Detects											
4461	Mean in Original Scale				1.66	Mean in Log Scale				0.24		
4462	SD in Original Scale				1.44	SD in Log Scale				0.69		
4463	95% t UCL (assumes normality of ROS data)				1.89	95% Percentile Bootstrap UCL				1.90		
4464	95% BCA Bootstrap UCL				1.94	95% Bootstrap t UCL				1.93		
4465	95% H-UCL (Log ROS)				1.87							
4466												
4467	DLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
4468	KM Mean (logged)				0.23	95% H-UCL (KM -Log)				1.93		
4469	KM SD (logged)				0.74	95% Critical H Value (KM-Log)				1.99		
4470	KM Standard Error of Mean (logged)				0.07							
4471												
4472	DL/2 Statistics											
4473	DL/2 Normal					DL/2 Log-Transformed						

	A	B	C	D	E	F	G	H	I	J	K	L
Mean in Original Scale	1.65					Mean in Log Scale	0.22					
SD in Original Scale	1.44					SD in Log Scale	0.78					
95% t UCL (Assumes normality)	1.89					95% H-Stat UCL	1.99					
DL/2 is not a recommended method, provided for comparisons and historical reasons												
Nonparametric Distribution Free UCL Statistics												
Detected Data appear Lognormal Distributed at 5% Significance Level												
Suggested UCL to Use												
95% KM (BCA) UCL	1.89											
ations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
Recommendations are based upon data size, data distribution, and skewness.												
mendations are based upon the results of the simulation studies summarized in Singh, Maichle, and												
ations results will not cover all Real World data sets; for additional insight the user may want to cons												
Uranium-234												
General Statistics												
Total Number of Observations	107					Number of Distinct Observations	69					
						Number of Missing Observations	0					
Minimum	0.68					Mean	1.42					
Maximum	6.1					Median	1.22					
SD	0.79					Std. Error of Mean	0.07					
Coefficient of Variation	0.55					Skewness	3.60					
Normal GOF Test												
Shapiro Wilk Test Statistic	0.56					Shapiro Wilk GOF Test						
5% Shapiro Wilk P Value	0					Data Not Normal at 5% Significance Level						
Lilliefors Test Statistic	0.31					Lilliefors GOF Test						
5% Lilliefors Critical Value	0.08					Data Not Normal at 5% Significance Level						
Data Not Normal at 5% Significance Level												
Assuming Normal Distribution												
95% Normal UCL						95% UCLs (Adjusted for Skewness)						
95% Student's-t UCL	1.55					95% Adjusted-CLT UCL (Chen-1995)	1.57					
						95% Modified-t UCL (Johnson-1978)	1.55					
Gamma GOF Test												
A-D Test Statistic	10.7					Anderson-Darling Gamma GOF Test						
5% A-D Critical Value	0.75					Data Not Gamma Distributed at 5% Significance Lev						
K-S Test Statistic	0.25					Kolmogrov-Smirnoff Gamma GOF Test						
5% K-S Critical Value	0.08					Data Not Gamma Distributed at 5% Significance Lev						
Data Not Gamma Distributed at 5% Significance Level												
Gamma Statistics												
k hat (MLE)	6.18					k star (bias corrected MLE)	6.01					
Theta hat (MLE)	0.23					Theta star (bias corrected MLE)	0.23					
nu hat (MLE)	1323					nu star (bias corrected)	1287					
MLE Mean (bias corrected)	1.42					MLE Sd (bias corrected)	0.58					
						Approximate Chi Square Value (0.05)	1205					
Adjusted Level of Significance	0.04					Adjusted Chi Square Value	1204					
Assuming Gamma Distribution												
roximate Gamma UCL (use when n>=50))	1.52					Adjusted Gamma UCL (use when n<50)	1.52					
Lognormal GOF Test												
Shapiro Wilk Test Statistic	0.77					Shapiro Wilk Lognormal GOF Test						
5% Shapiro Wilk P Value	0					Data Not Lognormal at 5% Significance Level						
Lilliefors Test Statistic	0.21					Lilliefors Lognormal GOF Test						
5% Lilliefors Critical Value	0.08					Data Not Lognormal at 5% Significance Level						
Data Not Lognormal at 5% Significance Level												

	A	B	C	D	E	F	G	H	I	J	K	L
4537												
4538	Lognormal Statistics											
4539	Minimum of Logged Data				-0.38		Mean of logged Data				0.27	
4540	Maximum of Logged Data				1.80		SD of logged Data				0.35	
4541												
4542	Assuming Lognormal Distribution											
4543	95% H-UCL				1.48		90% Chebyshev (MVUE) UCL				1.54	
4544	95% Chebyshev (MVUE) UCL				1.61		97.5% Chebyshev (MVUE) UCL				1.70	
4545	99% Chebyshev (MVUE) UCL				1.88							
4546												
4547	Nonparametric Distribution Free UCL Statistics											
4548	Data do not follow a Discernible Distribution (0.05)											
4549												
4550	Nonparametric Distribution Free UCLs											
4551	95% CLT UCL				1.54		95% Jackknife UCL				1.55	
4552	95% Standard Bootstrap UCL				1.55		95% Bootstrap-t UCL				1.60	
4553	95% Hall's Bootstrap UCL				1.59		95% Percentile Bootstrap UCL				1.56	
4554	95% BCA Bootstrap UCL				1.58							
4555	90% Chebyshev(Mean, Sd) UCL				1.65		95% Chebyshev(Mean, Sd) UCL				1.75	
4556	97.5% Chebyshev(Mean, Sd) UCL				1.90		99% Chebyshev(Mean, Sd) UCL				2.18	
4557												
4558	Suggested UCL to Use											
4559	95% Student's-t UCL				1.55		or 95% Modified-t UCL				1.55	
4560												
4561	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4562	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
4563	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
4564	For additional insight the user may want to consult a statistician.											
4565												
4566	Uranium-235/236											
4567												
4568	General Statistics											
4569	Total Number of Observations				107		Number of Distinct Observations				102	
4570	Number of Detects				42		Number of Non-Detects				65	
4571	Number of Distinct Detects				40		Number of Distinct Non-Detects				63	
4572	Minimum Detect				0.049		Minimum Non-Detect				0.027	
4573	Maximum Detect				0.27		Maximum Non-Detect				0.12	
4574	Variance Detects				0.002		Percent Non-Detects				60.7	
4575	Mean Detects				0.11		SD Detects				0.044	
4576	Median Detects				0.10		CV Detects				0.40	
4577	Skewness Detects				1.34		Kurtosis Detects				2.56	
4578	Mean of Logged Detects				-2.24		SD of Logged Detects				0.37	
4579												
4580	Normal GOF Test on Detects Only											
4581	Shapiro Wilk Test Statistic				0.86		Shapiro Wilk GOF Test					
4582	5% Shapiro Wilk Critical Value				0.94		Detected Data Not Normal at 5% Significance Level					
4583	Lilliefors Test Statistic				0.12		Lilliefors GOF Test					
4584	5% Lilliefors Critical Value				0.13		Detected Data appear Normal at 5% Significance Level					
4585	Detected Data appear Approximate Normal at 5% Significance Level											
4586												
4587	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4588	Mean				0.06		Standard Error of Mean				0.005	
4589	SD				0.052		95% KM (BCA) UCL				0.07	
4590	95% KM (t) UCL				0.069		95% KM (Percentile Bootstrap) UCL				0.07	
4591	95% KM (z) UCL				0.069		95% KM Bootstrap t UCL				0.07	
4592	90% KM Chebyshev UCL				0.076		95% KM Chebyshev UCL				0.08	
4593	97.5% KM Chebyshev UCL				0.093		99% KM Chebyshev UCL				0.11	
4594												
4595	Gamma GOF Tests on Detected Observations Only											
4596	A-D Test Statistic				0.48		Anderson-Darling GOF Test					
4597	5% A-D Critical Value				0.75		data appear Gamma Distributed at 5% Significance Level					
4598	K-S Test Statistic				0.11		Kolmogrov-Smirnoff GOF					
4599	5% K-S Critical Value				0.13		data appear Gamma Distributed at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
4600	Detected data appear Gamma Distributed at 5% Significance Level											
4601												
4602	Gamma Statistics on Detected Data Only											
4603	k hat (MLE)				7.11	k star (bias corrected MLE)				6.61		
4604	Theta hat (MLE)				0.01	Theta star (bias corrected MLE)				0.01		
4605	nu hat (MLE)				597.2	nu star (bias corrected)				555.9		
4606	MLE Mean (bias corrected)				0.11	MLE Sd (bias corrected)				0.04		
4607												
4608	Gamma Kaplan-Meier (KM) Statistics											
4609	k hat (KM)				1.38	nu hat (KM)				295.3		
4610	Approximate Chi Square Value (295.30, α)				256.5	Adjusted Chi Square Value (295.30, β)				256		
4611	Approximate KM-UCL (use when $n \geq 50$)				0.07	Gamma Adjusted KM-UCL (use when $n < 50$)				0.07		
4612												
4613	Gamma ROS Statistics using Imputed Non-Detects											
4614	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
4615	GROS may not be used when kstar of detected data is small such as < 0.1											
4616	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
4617	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
4618	Minimum				0.01	Mean				0.05		
4619	Maximum				0.27	Median				0.02		
4620	SD				0.05	CV				1.03		
4621	k hat (MLE)				1.07	k star (bias corrected MLE)				1.05		
4622	Theta hat (MLE)				0.05	Theta star (bias corrected MLE)				0.05		
4623	nu hat (MLE)				230	nu star (bias corrected)				224.9		
4624	MLE Mean (bias corrected)				0.05	MLE Sd (bias corrected)				0.05		
4625						Adjusted Level of Significance (β)				0.04		
4626	Approximate Chi Square Value (224.92, α)				191.2	Adjusted Chi Square Value (224.92, β)				190.8		
4627	Gamma Approximate UCL (use when $n \geq 50$)				0.06	Gamma Adjusted UCL (use when $n < 50$)				0.06		
4628												
4629	Lognormal GOF Test on Detected Observations Only											
4630	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test						
4631	5% Shapiro Wilk Critical Value				0.94	Detected Data Not Lognormal at 5% Significance Level						
4632	Lilliefors Test Statistic				0.10	Lilliefors GOF Test						
4633	5% Lilliefors Critical Value				0.13	Detected Data appear Lognormal at 5% Significance Level						
4634	Detected Data appear Approximate Lognormal at 5% Significance Level											
4635												
4636	Lognormal ROS Statistics Using Imputed Non-Detects											
4637	Mean in Original Scale				0.06	Mean in Log Scale				-2.83		
4638	SD in Original Scale				0.04	SD in Log Scale				0.53		
4639	95% t UCL (assumes normality of ROS data)				0.07	95% Percentile Bootstrap UCL				0.07		
4640	95% BCA Bootstrap UCL				0.07	95% Bootstrap t UCL				0.07		
4641	95% H-UCL (Log ROS)				0.07							
4642												
4643	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
4644	KM Mean (logged)				-3.11	95% H-UCL (KM -Log)				0.07		
4645	KM SD (logged)				0.78	95% Critical H Value (KM-Log)				2.02		
4646	KM Standard Error of Mean (logged)				0.08							
4647												
4648	DL/2 Statistics											
4649	DL/2 Normal					DL/2 Log-Transformed						
4650	Mean in Original Scale				0.06	Mean in Log Scale				-3.04		
4651	SD in Original Scale				0.05	SD in Log Scale				0.75		
4652	95% t UCL (Assumes normality)				0.07	95% H-Stat UCL				0.07		
4653	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4654												
4655	Nonparametric Distribution Free UCL Statistics											
4656	Detected Data appear Approximate Normal Distributed at 5% Significance Level											
4657												
4658	Suggested UCL to Use											
4659	95% KM (t) UCL				0.06	95% KM (Percentile Bootstrap) UCL				0.07		
4660												
4661	Conditions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4662	Recommendations are based upon data size, data distribution, and skewness.											

	A	B	C	D	E	F	G	H	I	J	K	L
4663	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
4664	Simulations results will not cover all Real World data sets; for additional insight the user may want to cons											
4665												
4666												
4667	Uranium-238											
4668												
4669	General Statistics											
4670	Total Number of Observations					107	Number of Distinct Observations					72
4671							Number of Missing Observations					0
4672	Minimum					0.85	Mean					1.58
4673	Maximum					5.17	Median					1.39
4674	SD					0.68	Std. Error of Mean					0.06
4675	Coefficient of Variation					0.43	Skewness					2.8
4676												
4677	Normal GOF Test											
4678	Shapiro Wilk Test Statistic					0.72	Shapiro Wilk GOF Test					
4679	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level					
4680	Lilliefors Test Statistic					0.19	Lilliefors GOF Test					
4681	5% Lilliefors Critical Value					0.08	Data Not Normal at 5% Significance Level					
4682	Data Not Normal at 5% Significance Level											
4683												
4684	Assuming Normal Distribution											
4685	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
4686	95% Student's-t UCL					1.69	95% Adjusted-CLT UCL (Chen-1995)					1.70
4687							95% Modified-t UCL (Johnson-1978)					1.69
4688												
4689	Gamma GOF Test											
4690	A-D Test Statistic					4.43	Anderson-Darling Gamma GOF Test					
4691	5% A-D Critical Value					0.75	Data Not Gamma Distributed at 5% Significance Level					
4692	K-S Test Statistic					0.14	Kolmogrov-Smirnoff Gamma GOF Test					
4693	5% K-S Critical Value					0.08	Data Not Gamma Distributed at 5% Significance Level					
4694	Data Not Gamma Distributed at 5% Significance Level											
4695												
4696	Gamma Statistics											
4697	k hat (MLE)					8.02	k star (bias corrected MLE)					7.80
4698	Theta hat (MLE)					0.19	Theta star (bias corrected MLE)					0.20
4699	nu hat (MLE)					1717	nu star (bias corrected)					1670
4700	MLE Mean (bias corrected)					1.58	MLE Sd (bias corrected)					0.56
4701							Approximate Chi Square Value (0.05)					1576
4702	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					1575
4703												
4704	Assuming Gamma Distribution											
4705	Approximate Gamma UCL (use when n>=50))					1.67	Adjusted Gamma UCL (use when n<50)					1.67
4706												
4707	Lognormal GOF Test											
4708	Shapiro Wilk Test Statistic					0.89	Shapiro Wilk Lognormal GOF Test					
4709	5% Shapiro Wilk P Value					2.679E-	Data Not Lognormal at 5% Significance Level					
4710	Lilliefors Test Statistic					0.11	Lilliefors Lognormal GOF Test					
4711	5% Lilliefors Critical Value					0.08	Data Not Lognormal at 5% Significance Level					
4712	Data Not Lognormal at 5% Significance Level											
4713												
4714	Lognormal Statistics											
4715	Minimum of Logged Data					-0.15	Mean of logged Data					0.39
4716	Maximum of Logged Data					1.64	SD of logged Data					0.33
4717												
4718	Assuming Lognormal Distribution											
4719	95% H-UCL					1.65	90% Chebyshev (MVUE) UCL					1.72
4720	95% Chebyshev (MVUE) UCL					1.78	97.5% Chebyshev (MVUE) UCL					1.88
4721	99% Chebyshev (MVUE) UCL					2.07						
4722												
4723	Nonparametric Distribution Free UCL Statistics											
4724	Data do not follow a Discernible Distribution (0.05)											
4725												

	A	B	C	D	E	F	G	H	I	J	K	L	
4726	Nonparametric Distribution Free UCLs												
4727	95% CLT UCL					1.69	95% Jackknife UCL					1.69	
4728	95% Standard Bootstrap UCL					1.69	95% Bootstrap-t UCL					1.71	
4729	95% Hall's Bootstrap UCL					1.71	95% Percentile Bootstrap UCL					1.69	
4730	95% BCA Bootstrap UCL					1.70							
4731	90% Chebyshev(Mean, Sd) UCL					1.78	95% Chebyshev(Mean, Sd) UCL					1.87	
4732	97.5% Chebyshev(Mean, Sd) UCL					1.99	99% Chebyshev(Mean, Sd) UCL					2.24	
4733													
4734	Suggested UCL to Use												
4735	95% Student's-t UCL					1.69	or 95% Modified-t UCL					1.69	
4736													
4737	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate UCL.												
4738	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Singh (2003). However, simulations results will not cover all Real World data sets.												
4739	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.												
4740	For additional insight the user may want to consult a statistician.												
4741													
4742													
4743	Vanadium												
4744													
4745	General Statistics												
4746	Total Number of Observations					107	Number of Distinct Observations					83	
4747							Number of Missing Observations					0	
4748	Minimum					2.46	Mean					13.11	
4749	Maximum					26.6	Median					12.11	
4750	SD					4.61	Std. Error of Mean					0.44	
4751	Coefficient of Variation					0.35	Skewness					0.90	
4752													
4753	Normal GOF Test												
4754	Shapiro Wilk Test Statistic					0.93	Shapiro Wilk GOF Test						
4755	5% Shapiro Wilk P Value					7.8766E-05	Data Not Normal at 5% Significance Level						
4756	Lilliefors Test Statistic					0.11	Lilliefors GOF Test						
4757	5% Lilliefors Critical Value					0.081	Data Not Normal at 5% Significance Level						
4758	Data Not Normal at 5% Significance Level												
4759													
4760	Assuming Normal Distribution												
4761	95% Normal UCL						95% UCLs (Adjusted for Skewness)						
4762	95% Student's-t UCL					13.9	95% Adjusted-CLT UCL (Chen-1995)					13.9	
4763							95% Modified-t UCL (Johnson-1978)					13.9	
4764													
4765	Gamma GOF Test												
4766	A-D Test Statistic					0.88	Anderson-Darling Gamma GOF Test						
4767	5% A-D Critical Value					0.75	Data Not Gamma Distributed at 5% Significance Level						
4768	K-S Test Statistic					0.071	Kolmogorov-Smirnov Gamma GOF Test						
4769	5% K-S Critical Value					0.081	Data appear Gamma Distributed at 5% Significance Level						
4770	Detected data follow Appr. Gamma Distribution at 5% Significance Level												
4771													
4772	Gamma Statistics												
4773	k hat (MLE)					8.41	k star (bias corrected MLE)					8.18	
4774	Theta hat (MLE)					1.56	Theta star (bias corrected MLE)					1.60	
4775	nu hat (MLE)					1801	nu star (bias corrected)					1752	
4776	MLE Mean (bias corrected)					13.11	MLE Sd (bias corrected)					4.59	
4777							Approximate Chi Square Value (0.05)					1656	
4778	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					1655	
4779													
4780	Assuming Gamma Distribution												
4781	Approximate Gamma UCL (use when n>=50)					13.9	Adjusted Gamma UCL (use when n<50)					13.9	
4782													
4783	Lognormal GOF Test												
4784	Shapiro Wilk Test Statistic					0.96	Shapiro Wilk Lognormal GOF Test						
4785	5% Shapiro Wilk P Value					0.021	Data Not Lognormal at 5% Significance Level						
4786	Lilliefors Test Statistic					0.051	Lilliefors Lognormal GOF Test						
4787	5% Lilliefors Critical Value					0.081	Data appear Lognormal at 5% Significance Level						
4788	Data appear Approximate Lognormal at 5% Significance Level												

	A	B	C	D	E	F	G	H	I	J	K	L
4789												
4790	Lognormal Statistics											
4791	Minimum of Logged Data				0.9		Mean of logged Data				2.51	
4792	Maximum of Logged Data				3.28		SD of logged Data				0.35	
4793												
4794	Assuming Lognormal Distribution											
4795	95% H-UCL				14.01		90% Chebyshev (MVUE) UCL				14.6	
4796	95% Chebyshev (MVUE) UCL				15.24		97.5% Chebyshev (MVUE) UCL				16.11	
4797	99% Chebyshev (MVUE) UCL				17.81							
4798												
4799	Nonparametric Distribution Free UCL Statistics											
4800	Data appear to follow a Discernible Distribution at 5% Significance Level											
4801												
4802	Nonparametric Distribution Free UCLs											
4803	95% CLT UCL				13.81		95% Jackknife UCL				13.81	
4804	95% Standard Bootstrap UCL				13.81		95% Bootstrap-t UCL				13.91	
4805	95% Hall's Bootstrap UCL				13.91		95% Percentile Bootstrap UCL				13.91	
4806	95% BCA Bootstrap UCL				13.81							
4807	90% Chebyshev(Mean, Sd) UCL				14.41		95% Chebyshev(Mean, Sd) UCL				15.11	
4808	97.5% Chebyshev(Mean, Sd) UCL				15.91		99% Chebyshev(Mean, Sd) UCL				17.51	
4809												
4810	Suggested UCL to Use											
4811	95% Approximate Gamma UCL				13.91							
4812												
4813	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4814	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
4815	Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
4816	For additional insight the user may want to consult a statistician.											
4817												
4818	Xylene[1,3-]+Xylene[1,4-]											
4819												
4820	General Statistics											
4821	Total Number of Observations				107		Number of Distinct Observations				74	
4822	Number of Detects				15		Number of Non-Detects				92	
4823	Number of Distinct Detects				15		Number of Distinct Non-Detects				59	
4824	Minimum Detect				3.4300E		Minimum Non-Detect				0.002	
4825	Maximum Detect				9.6000E		Maximum Non-Detect				0.003	
4826	Variance Detects				3.5702E		Percent Non-Detects				85.91	
4827	Mean Detects				5.7733E		SD Detects				1.8895E	
4828	Median Detects				5.3000E		CV Detects				0.32	
4829	Skewness Detects				0.69		Kurtosis Detects				-0.68	
4830	Mean of Logged Detects				-7.501		SD of Logged Detects				0.31	
4831												
4832	Normal GOF Test on Detects Only											
4833	Shapiro Wilk Test Statistic				0.90		Shapiro Wilk GOF Test					
4834	5% Shapiro Wilk Critical Value				0.88		Detected Data appear Normal at 5% Significance Level					
4835	Lilliefors Test Statistic				0.22		Lilliefors GOF Test					
4836	5% Lilliefors Critical Value				0.22		Detected Data appear Normal at 5% Significance Level					
4837	Detected Data appear Normal at 5% Significance Level											
4838												
4839	Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
4840	Mean				5.7733E		Standard Error of Mean				4.8787E	
4841	SD				1.8254E		95% KM (BCA) UCL				6.5785E	
4842	95% KM (t) UCL				6.5829E		95% KM (Percentile Bootstrap) UCL				6.5838E	
4843	95% KM (z) UCL				6.5758E		95% KM Bootstrap t UCL				6.7847E	
4844	90% KM Chebyshev UCL				7.2369E		95% KM Chebyshev UCL				7.8999E	
4845	97.5% KM Chebyshev UCL				8.8201E		99% KM Chebyshev UCL				0.001	
4846												
4847	Gamma GOF Tests on Detected Observations Only											
4848	A-D Test Statistic				0.49		Anderson-Darling GOF Test					
4849	5% A-D Critical Value				0.73		Detected data appear Gamma Distributed at 5% Significance Level					
4850	K-S Test Statistic				0.19		Kolmogrov-Smirnoff GOF					
4851	5% K-S Critical Value				0.22		Detected data appear Gamma Distributed at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
4852	Detected data appear Gamma Distributed at 5% Significance Level											
4853												
4854	Gamma Statistics on Detected Data Only											
4855	k hat (MLE)				10.61		k star (bias corrected MLE)				8.53	
4856	Theta hat (MLE)				5.4377E		Theta star (bias corrected MLE)				6.7618E	
4857	nu hat (MLE)				318.5		nu star (bias corrected)				256.1	
4858	MLE Mean (bias corrected)				5.7733E		MLE Sd (bias corrected)				1.9758E	
4859												
4860	Gamma Kaplan-Meier (KM) Statistics											
4861	k hat (KM)				10		nu hat (KM)				2141	
4862	Approximate Chi Square Value (N/A, α)				2034		Adjusted Chi Square Value (N/A, β)				2033	
4863	Approximate KM-UCL (use when n>=50)				6.0755E		Gamma Adjusted KM-UCL (use when n<50)				6.0797E	
4864												
4865	Gamma ROS Statistics using Imputed Non-Detects											
4866	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
4867	GROS may not be used when kstar of detected data is small such as < 0.1											
4868	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
4869	Gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
4870	Minimum				3.4300E		Mean				0.008	
4871	Maximum				0.01		Median				0.01	
4872	SD				0.003		CV				0.37	
4873	k hat (MLE)				2.03		k star (bias corrected MLE)				1.98	
4874	Theta hat (MLE)				0.004		Theta star (bias corrected MLE)				0.004	
4875	nu hat (MLE)				436.3		nu star (bias corrected)				425.4	
4876	MLE Mean (bias corrected)				0.008		MLE Sd (bias corrected)				0.006	
4877							Adjusted Level of Significance (β)				0.04	
4878	Approximate Chi Square Value (425.43, α)				378.6		Adjusted Chi Square Value (425.43, β)				378	
4879	Gamma Approximate UCL (use when n>=50)				0.009		Gamma Adjusted UCL (use when n<50)				0.009	
4880												
4881	Lognormal GOF Test on Detected Observations Only											
4882	Shapiro Wilk Test Statistic				0.94		Shapiro Wilk GOF Test					
4883	5% Shapiro Wilk Critical Value				0.88		Detected Data appear Lognormal at 5% Significance Level					
4884	Lilliefors Test Statistic				0.17		Lilliefors GOF Test					
4885	5% Lilliefors Critical Value				0.22		Detected Data appear Lognormal at 5% Significance Level					
4886	Detected Data appear Lognormal at 5% Significance Level											
4887												
4888	Lognormal ROS Statistics Using Imputed Non-Detects											
4889	Mean in Original Scale				5.5855E		Mean in Log Scale				-7.50	
4890	SD in Original Scale				9.8706E		SD in Log Scale				0.17	
4891	95% t UCL (assumes normality of ROS data)				5.7439E		95% Percentile Bootstrap UCL				5.7394E	
4892	95% BCA Bootstrap UCL				5.7426E		95% Bootstrap t UCL				5.7510E	
4893	95% H-UCL (Log ROS)				5.7445E							
4894												
4895	UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed											
4896	KM Mean (logged)				-7.50		95% H-UCL (KM -Log)				6.0746E	
4897	KM SD (logged)				0.30		95% Critical H Value (KM-Log)				1.73	
4898	KM Standard Error of Mean (logged)				0.08							
4899												
4900	DL/2 Statistics											
4901	DL/2 Normal					DL/2 Log-Transformed						
4902	Mean in Original Scale				0.001		Mean in Log Scale				-6.79	
4903	SD in Original Scale				2.8654E		SD in Log Scale				0.32	
4904	95% t UCL (Assumes normality)				0.001		95% H-Stat UCL				0.001	
4905	DL/2 is not a recommended method, provided for comparisons and historical reasons											
4906												
4907	Nonparametric Distribution Free UCL Statistics											
4908	Detected Data appear Normal Distributed at 5% Significance Level											
4909												
4910	Suggested UCL to Use											
4911	95% KM (t) UCL				6.5829E		95% KM (Percentile Bootstrap) UCL				6.5838E	
4912												
4913	Conditions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate											
4914	Recommendations are based upon data size, data distribution, and skewness.											

	A	B	C	D	E	F	G	H	I	J	K	L
4915	Recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and											
4916	Recommendations results will not cover all Real World data sets; for additional insight the user may want to cons											
4917												
4918												
4919	Zinc											
4920												
4921	General Statistics											
4922	Total Number of Observations					107	Number of Distinct Observations					96
4923							Number of Missing Observations					0
4924	Minimum					24.9	Mean					70.8
4925	Maximum					1320	Median					40.4
4926	SD					152.5	Std. Error of Mean					14.7
4927	Coefficient of Variation					2.15	Skewness					7.05
4928												
4929	Normal GOF Test											
4930	Shapiro Wilk Test Statistic					0.25	Shapiro Wilk GOF Test					
4931	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level					
4932	Lilliefors Test Statistic					0.38	Lilliefors GOF Test					
4933	5% Lilliefors Critical Value					0.081	Data Not Normal at 5% Significance Level					
4934	Data Not Normal at 5% Significance Level											
4935												
4936	Assuming Normal Distribution											
4937	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
4938	95% Student's-t UCL					95.31	95% Adjusted-CLT UCL (Chen-1995)					105.9
4939							95% Modified-t UCL (Johnson-1978)					97.0
4940												
4941	Gamma GOF Test											
4942	A-D Test Statistic					16.9	Anderson-Darling Gamma GOF Test					
4943	5% A-D Critical Value					0.77	Data Not Gamma Distributed at 5% Significance Level					
4944	K-S Test Statistic					0.29	Kolmogorov-Smirnov Gamma GOF Test					
4945	5% K-S Critical Value					0.081	Data Not Gamma Distributed at 5% Significance Level					
4946	Data Not Gamma Distributed at 5% Significance Level											
4947												
4948	Gamma Statistics											
4949	k hat (MLE)					1.43	k star (bias corrected MLE)					1.40
4950	Theta hat (MLE)					49.31	Theta star (bias corrected MLE)					50.5
4951	nu hat (MLE)					307.5	nu star (bias corrected)					300.2
4952	MLE Mean (bias corrected)					70.8	MLE Sd (bias corrected)					59.8
4953							Approximate Chi Square Value (0.05)					261.1
4954	Adjusted Level of Significance					0.04	Adjusted Chi Square Value					260.6
4955												
4956	Assuming Gamma Distribution											
4957	Approximate Gamma UCL (use when n>=50))					81.4	Adjusted Gamma UCL (use when n<50)					81.6
4958												
4959	Lognormal GOF Test											
4960	Shapiro Wilk Test Statistic					0.69	Shapiro Wilk Lognormal GOF Test					
4961	5% Shapiro Wilk P Value					0	Data Not Lognormal at 5% Significance Level					
4962	Lilliefors Test Statistic					0.20	Lilliefors Lognormal GOF Test					
4963	5% Lilliefors Critical Value					0.081	Data Not Lognormal at 5% Significance Level					
4964	Data Not Lognormal at 5% Significance Level											
4965												
4966	Lognormal Statistics											
4967	Minimum of Logged Data					3.21	Mean of logged Data					3.87
4968	Maximum of Logged Data					7.18	SD of logged Data					0.60
4969												
4970	Assuming Lognormal Distribution											
4971	95% H-UCL					64.3	90% Chebyshev (MVUE) UCL					68.3
4972	95% Chebyshev (MVUE) UCL					73.2	97.5% Chebyshev (MVUE) UCL					80.0
4973	99% Chebyshev (MVUE) UCL					93.4						
4974												
4975	Nonparametric Distribution Free UCL Statistics											
4976	Data do not follow a Discernible Distribution (0.05)											
4977												

	A	B	C	D	E	F	G	H	I	J	K	L	
4978	Nonparametric Distribution Free UCLs												
4979	95% CLT UCL					95.1	95% Jackknife UCL					95.3	
4980	95% Standard Bootstrap UCL					95.2	95% Bootstrap-t UCL					178.1	
4981	95% Hall's Bootstrap UCL					200.9	95% Percentile Bootstrap UCL					97.2	
4982	95% BCA Bootstrap UCL					112.1							
4983	90% Chebyshev(Mean, Sd) UCL					115.1	95% Chebyshev(Mean, Sd) UCL					135.1	
4984	97.5% Chebyshev(Mean, Sd) UCL					162.9	99% Chebyshev(Mean, Sd) UCL					217.6	
4985													
4986	Suggested UCL to Use												
4987	95% Chebyshev (Mean, Sd) UCL					135.1							
4988													
4989	Recommendations regarding the selection of a 95% UCL are provided to help the user to select the most appropriate												
4990	Recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and												
4991	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets												
4992	For additional insight the user may want to consult a statistician.												
4993													