	A	B	C	D	E	F	G	H	I	J	K	L
1				General UCL Statistics for Data Sets with Non-Detects								
2	User Selected Options											
3			From File	Sheet1.wst								
4			Full Precision	OFF								
5			Confidence Coefficient	95%								
6	mber of Bootstrap Operations			2000								
7												
8												
9	Result_Value (1,3-dichlorobenzene_ug/kg)											
10												
11						General Statistics						
12						Number of Valid Data	9			Number of Detected Data		0
13						Number of Distinct Detected Data	0			Number of Non-Detect Data		9
14										Percent Non-Detects		100.00%
15												
16				Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
17				Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
18	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).											
19												
20				The data set for variable Result_Value (1,3-dichlorobenzene_ug/kg) was not processed!								
21												
22												
23												
24	Result_Value (hexachlorobenzene_ug/kg)											
25												
26						General Statistics						
27						Number of Valid Data	9			Number of Detected Data		7
28						Number of Distinct Detected Data	7			Number of Non-Detect Data		2
29										Percent Non-Detects		22.22%
30												
31				Raw Statistics						Log-transformed Statistics		
32						Minimum Detected	389			Minimum Detected		5.964
33						Maximum Detected	1830			Maximum Detected		7.512
34						Mean of Detected	822.6			Mean of Detected		6.554
35						SD of Detected	529.7			SD of Detected		0.593
36						Minimum Non-Detect	727			Minimum Non-Detect		6.589
37						Maximum Non-Detect	742			Maximum Non-Detect		6.609
38												
39	Note: Data have multiple DLs - Use of KM Method is recommen									Number treated as Non-Detect		6
40	For all methods (except KM, DL/2, and ROS Methods),									Number treated as Detected		3
41	Observations < Largest ND are treated as NDs									Single DL Non-Detect Percentage		66.67%
42												
43				Warning: There are only 7 Detected Values in this data								
44				Note: It should be noted that even though bootstrap may be performed on this data set								
45				the resulting calculations may not be reliable enough to draw conclusions								
46												
47				It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.								
48												
49												
50						UCL Statistics						
51				Normal Distribution Test with Detected Values Only						Lognormal Distribution Test with Detected Values Only		
52						Shapiro Wilk Test Statistic	0.832			Shapiro Wilk Test Statistic		0.892
53						5% Shapiro Wilk Critical Value	0.803			5% Shapiro Wilk Critical Value		0.803
54				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
55												
56				Assuming Normal Distribution						Assuming Lognormal Distribution		
57						DL/2 Substitution Method				DL/2 Substitution Method		
58						Mean	721.4			Mean		6.41
59						SD	500.8			SD		0.587
60						95% DL/2 (t) UCL	1032			95% H-Stat (DL/2) UCL		1190
61												
62						Maximum Likelihood Estimate(MLE) Method				Log ROS Method		
63						Mean	1360			Mean in Log Scale		6.47
64						SD	368.9			SD in Log Scale		0.539
65						95% MLE (t) UCL	1588			Mean in Original Scale		746.7
66						95% MLE (Tiku) UCL	1748			SD in Original Scale		482.8
67										95% t UCL		1046
68										95% Percentile Bootstrap UCL		1016
69										95% BCA Bootstrap UCL		1103
70										95% H UCL		1157
71												
72				Gamma Distribution Test with Detected Values Only						Data Distribution Test with Detected Values Only		
73						k star (bias corrected)	1.984			Data appear Normal at 5% Significance Level		

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	A	B	C	D	E	F	G	H	I	J	K	L
74					Theta Star	414.6						
75					nu star	27.78						
76												
77					A-D Test Statistic	0.472			Nonparametric Statistics			
78					5% A-D Critical Value	0.711				Kaplan-Meier (KM) Method		
79					K-S Test Statistic	0.711					Mean	740.9
80					5% K-S Critical Value	0.313					SD	459.7
81	Data appear Gamma Distributed at 5% Significance Level										SE of Mean	166
82											95% KM (t) UCL	1050
83			Assuming Gamma Distribution								95% KM (z) UCL	1014
84			Gamma ROS Statistics using Extrapolated Data								95% KM (jackknife) UCL	1045
85					Minimum	389					95% KM (bootstrap t) UCL	1310
86					Maximum	1830					95% KM (BCA) UCL	1057
87					Mean	758.1					95% KM (Percentile Bootstrap) UCL	1033
88					Median	532.6					95% KM (Chebyshev) UCL	1465
89					SD	476.3					97.5% KM (Chebyshev) UCL	1778
90					k star	2.586					99% KM (Chebyshev) UCL	2393
91					Theta star	293.2						
92					Nu star	46.54			Potential UCLs to Use			
93					AppChi2	31.89					95% KM (t) UCL	1050
94			95% Gamma Approximate UCL (Use when n >= 40)			1107					95% KM (Percentile Bootstrap) UCL	1033
95			95% Adjusted Gamma UCL (Use when n < 40)			1202						
96	Note: DL/2 is not a recommended method.											
97												
98	ote: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UC											
99	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006)											
100	For additional insight, the user may want to consult a statistician.											
101												
102												
103	Result_Value (mercury_mg/kg)											
104												
105					General Statistics							
106					Number of Valid Observations	9					Number of Distinct Observations	8
107												
108					Raw Statistics				Log-transformed Statistics			
109					Minimum	0.024					Minimum of Log Data	-3.73
110					Maximum	0.122					Maximum of Log Data	-2.104
111					Mean	0.0516					Mean of log Data	-3.096
112					Geometric Mean	0.0452					SD of log Data	0.513
113					Median	0.041						
114					SD	0.0317						
115					Std. Error of Mean	0.0106						
116					Coefficient of Variation	0.614						
117					Skewness	1.75						
118												
119												
120					Warning: There are only 9 Values in this data							
121					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
122					the resulting calculations may not be reliable enough to draw conclusions							
123												
124					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
125												
126					Relevant UCL Statistics							
127					Normal Distribution Test				Lognormal Distribution Test			
128					Shapiro Wilk Test Statistic	0.768					Shapiro Wilk Test Statistic	0.896
129					Shapiro Wilk Critical Value	0.829					Shapiro Wilk Critical Value	0.829
130					Data not Normal at 5% Significance Level				Data appear Lognormal at 5% Significance Level			
131												
132					Assuming Normal Distribution				Assuming Lognormal Distribution			
133					95% Student's-t UCL	0.0712					95% H-UCL	0.0775
134					95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	0.0891
135					95% Adjusted-CLT UCL (Chen-1995)	0.0755					97.5% Chebyshev (MVUE) UCL	0.106
136					95% Modified-t UCL (Johnson-1978)	0.0722					99% Chebyshev (MVUE) UCL	0.138
137												
138					Gamma Distribution Test				Data Distribution			
139					k star (bias corrected)	2.728			Data Follow Appr. Gamma Distribution at 5% Significance Leve			
140					Theta Star	0.0189						
141					MLE of Mean	0.0516						
142					MLE of Standard Deviation	0.0312						
143					nu star	49.11						
144					Approximate Chi Square Value (.05)	34.02			Nonparametric Statistics			
145					Adjusted Level of Significance	0.0231					95% CLT UCL	0.0689
146					Adjusted Chi Square Value	31.39					95% Jackknife UCL	0.0712

	A	B	C	D	E	F	G	H	I	J	K	L
147											95% Standard Bootstrap UCL	0.0678
148					Anderson-Darling Test Statistic	0.685					95% Bootstrap-t UCL	0.115
149					Anderson-Darling 5% Critical Value	0.725					95% Hall's Bootstrap UCL	0.19
150					Kolmogorov-Smirnov Test Statistic	0.283					95% Percentile Bootstrap UCL	0.0699
151					Kolmogorov-Smirnov 5% Critical Value	0.28					95% BCA Bootstrap UCL	0.0746
152	Data follow Appr. Gamma Distribution at 5% Significance Leve										95% Chebyshev(Mean, Sd) UCL	0.0975
153											97.5% Chebyshev(Mean, Sd) UCL	0.117
154					Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL	0.157
155			95% Approximate Gamma UCL (Use when n >= 40)			0.0744						
156			95% Adjusted Gamma UCL (Use when n < 40)			0.0806						
157												
158					Potential UCL to Use						Use 95% Approximate Gamma UCL	0.0744
159												
160	ote: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UC											
161	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
162	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
163												
164												
165	Result_Value (total dioxin/furan teq 1998 (avian) (u = 1/2)_ng/kg)											
166												
167					General Statistics							
168					Number of Valid Observations	9					Number of Distinct Observations	9
169												
170					Raw Statistics						Log-transformed Statistics	
171					Minimum	11.32					Minimum of Log Data	2.426
172					Maximum	77.75					Maximum of Log Data	4.354
173					Mean	32.28					Mean of log Data	3.315
174					Geometric Mean	27.51					SD of log Data	0.599
175					Median	27.48						
176					SD	20.21						
177					Std. Error of Mean	6.737						
178					Coefficient of Variation	0.626						
179					Skewness	1.491						
180												
181												
182					Warning: There are only 9 Values in this data							
183					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
184					the resulting calculations may not be reliable enough to draw conclusions							
185												
186					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
187												
188					Relevant UCL Statistics							
189					Normal Distribution Test						Lognormal Distribution Test	
190					Shapiro Wilk Test Statistic	0.868					Shapiro Wilk Test Statistic	0.972
191					Shapiro Wilk Critical Value	0.829					Shapiro Wilk Critical Value	0.829
192					Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level	
193												
194					Assuming Normal Distribution						Assuming Lognormal Distribution	
195					95% Student's-t UCL	44.81					95% H-UCL	55.16
196					95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL	60.75
197					95% Adjusted-CLT UCL (Chen-1995)	46.94					97.5% Chebyshev (MVUE) UCL	73.11
198					95% Modified-t UCL (Johnson-1978)	45.37					99% Chebyshev (MVUE) UCL	97.38
199												
200					Gamma Distribution Test						Data Distribution	
201					k star (bias corrected)	2.264					Data appear Normal at 5% Significance Level	
202					Theta Star	14.26						
203					MLE of Mean	32.28						
204					MLE of Standard Deviation	21.45						
205					nu star	40.76						
206					Approximate Chi Square Value (.05)	27.13					Nonparametric Statistics	
207					Adjusted Level of Significance	0.0231					95% CLT UCL	43.36
208					Adjusted Chi Square Value	24.8					95% Jackknife UCL	44.81
209											95% Standard Bootstrap UCL	42.68
210					Anderson-Darling Test Statistic	0.235					95% Bootstrap-t UCL	50.78
211					Anderson-Darling 5% Critical Value	0.726					95% Hall's Bootstrap UCL	93.65
212					Kolmogorov-Smirnov Test Statistic	0.144					95% Percentile Bootstrap UCL	42.79
213					Kolmogorov-Smirnov 5% Critical Value	0.281					95% BCA Bootstrap UCL	45.25
214					Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL	61.65
215											97.5% Chebyshev(Mean, Sd) UCL	74.36
216					Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL	99.32
217			95% Approximate Gamma UCL (Use when n >= 40)			48.5						
218			95% Adjusted Gamma UCL (Use when n < 40)			53.04						
219												

	A	B	C	D	E	F	G	H	I	J	K	L
220				Potential UCL to Use						Use 95% Student's-t UCL		44.81
221												
222	ote: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UC											
223	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
224	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
225												
226												
227	Result_Value (total pcb congener (u = 1/2)_ng/kg)											
228												
229					General Statistics							
230				Number of Valid Observations		9				Number of Distinct Observations		9
231												
232				Raw Statistics						Log-transformed Statistics		
233					Minimum	596176				Minimum of Log Data		13.3
234					Maximum	4538571				Maximum of Log Data		15.33
235					Mean	2245578				Mean of log Data		14.5
236					Geometric Mean	1980326				SD of log Data		0.567
237					Median	1870516						
238					SD	1126038						
239					Std. Error of Mean	375346						
240					Coefficient of Variation	0.501						
241					Skewness	0.863						
242												
243												
244					Warning: There are only 9 Values in this data							
245					Note: It should be noted that even though bootstrap methods may be performed on this data set,							
246					the resulting calculations may not be reliable enough to draw conclusions							
247												
248					The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.							
249												
250					Relevant UCL Statistics							
251				Normal Distribution Test						Lognormal Distribution Test		
252					Shapiro Wilk Test Statistic	0.943				Shapiro Wilk Test Statistic		0.93
253					Shapiro Wilk Critical Value	0.829				Shapiro Wilk Critical Value		0.829
254				Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level		
255												
256				Assuming Normal Distribution						Assuming Lognormal Distribution		
257					95% Student's-t UCL	2943552				95% H-UCL		3728595
258				95% UCLs (Adjusted for Skewness)						95% Chebyshev (MVUE) UCL		4190605
259					95% Adjusted-CLT UCL (Chen-1995)	2978369				97.5% Chebyshev (MVUE) UCL		5017398
260					95% Modified-t UCL (Johnson-1978)	2961552				99% Chebyshev (MVUE) UCL		6641472
261												
262				Gamma Distribution Test						Data Distribution		
263					k star (bias corrected)	2.832				Data appear Normal at 5% Significance Level		
264					Theta Star	792905						
265					MLE of Mean	2245578						
266					MLE of Standard Deviation	1334365						
267					nu star	50.98						
268					Approximate Chi Square Value (.05)	35.58				Nonparametric Statistics		
269					Adjusted Level of Significance	0.0231				95% CLT UCL		2862967
270					Adjusted Chi Square Value	32.89				95% Jackknife UCL		2943552
271										95% Standard Bootstrap UCL		2820076
272					Anderson-Darling Test Statistic	0.266				95% Bootstrap-t UCL		3139522
273					Anderson-Darling 5% Critical Value	0.725				95% Hall's Bootstrap UCL		3592619
274					Kolmogorov-Smirnov Test Statistic	0.165				95% Percentile Bootstrap UCL		2856215
275					Kolmogorov-Smirnov 5% Critical Value	0.28				95% BCA Bootstrap UCL		2896428
276				Data appear Gamma Distributed at 5% Significance Level						95% Chebyshev(Mean, Sd) UCL		3881673
277										97.5% Chebyshev(Mean, Sd) UCL		4589613
278				Assuming Gamma Distribution						99% Chebyshev(Mean, Sd) UCL		5980224
279					95% Approximate Gamma UCL (Use when n >= 40)	3217268						
280					95% Adjusted Gamma UCL (Use when n < 40)	3480705						
281												
282				Potential UCL to Use						Use 95% Student's-t UCL		2943552
283												
284	ote: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UC											
285	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
286	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
287												
288												
289	Result_Value (total pcb congener teq 1998 (avian) (u = 1/2)_ng/kg)											
290												
291					General Statistics							
292				Number of Valid Observations		9				Number of Distinct Observations		9

	A	B	C	D	E	F	G	H	I	J	K	L
293												
294				**Raw Statistics**					**Log-transformed Statistics**			
295					Minimum	103.7			Minimum of Log Data			4.642
296					Maximum	789.3			Maximum of Log Data			6.671
297					Mean	355.8			Mean of log Data			5.746
298					Geometric Mean	313			SD of log Data			0.553
299					Median	321.5						
300					SD	193.1						
301					Std. Error of Mean	64.38						
302					Coefficient of Variation	0.543						
303					Skewness	1.422						
304												
305												
306				**Warning: There are only 9 Values in this data**								
307				**Note: It should be noted that even though bootstrap methods may be performed on this data set,**								
308				**the resulting calculations may not be reliable enough to draw conclusions**								
309												
310				**The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.**								
311												
312					**Relevant UCL Statistics**							
313				**Normal Distribution Test**					**Lognormal Distribution Test**			
314					Shapiro Wilk Test Statistic	0.879			Shapiro Wilk Test Statistic			0.944
315					Shapiro Wilk Critical Value	0.829			Shapiro Wilk Critical Value			0.829
316				**Data appear Normal at 5% Significance Level**					**Data appear Lognormal at 5% Significance Level**			
317												
318				**Assuming Normal Distribution**					**Assuming Lognormal Distribution**			
319					95% Student's-t UCL	475.5			95% H-UCL			574.8
320				**95% UCLs (Adjusted for Skewness)**					95% Chebyshev (MVUE) UCL			650.6
321					95% Adjusted-CLT UCL (Chen-1995)	494.3			97.5% Chebyshev (MVUE) UCL			777.2
322					95% Modified-t UCL (Johnson-1978)	480.6			99% Chebyshev (MVUE) UCL			1026
323												
324				**Gamma Distribution Test**					**Data Distribution**			
325					k star (bias corrected)	2.784			**Data appear Normal at 5% Significance Level**			
326					Theta Star	127.8						
327					MLE of Mean	355.8						
328					MLE of Standard Deviation	213.3						
329					nu star	50.11						
330					Approximate Chi Square Value (.05)	34.85			**Nonparametric Statistics**			
331					Adjusted Level of Significance	0.0231			95% CLT UCL			461.7
332					Adjusted Chi Square Value	32.19			95% Jackknife UCL			475.5
333									95% Standard Bootstrap UCL			456.5
334					Anderson-Darling Test Statistic	0.322			95% Bootstrap-t UCL			531.9
335					Anderson-Darling 5% Critical Value	0.725			95% Hall's Bootstrap UCL			1055
336					Kolmogorov-Smirnov Test Statistic	0.172			95% Percentile Bootstrap UCL			458.7
337					Kolmogorov-Smirnov 5% Critical Value	0.28			95% BCA Bootstrap UCL			485.7
338				**Data appear Gamma Distributed at 5% Significance Level**					95% Chebyshev(Mean, Sd) UCL			636.4
339									97.5% Chebyshev(Mean, Sd) UCL			757.9
340				**Assuming Gamma Distribution**					99% Chebyshev(Mean, Sd) UCL			996.4
341				95% Approximate Gamma UCL (Use when n >= 40)		511.5						
342				95% Adjusted Gamma UCL (Use when n < 40)		553.8						
343												
344				**Potential UCL to Use**					Use 95% Student's-t UCL			475.5
345												
346	**ote: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UC**											
347	**These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)**											
348	**and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.**											
349												
350												
351	**Result_Value (total pcb congener teq 2005 (mammal) (u = 1/2)_ng/kg)**											
352												
353					**General Statistics**							
354					Number of Valid Observations	9			Number of Distinct Observations			9
355												
356				**Raw Statistics**					**Log-transformed Statistics**			
357					Minimum	4.26			Minimum of Log Data			1.449
358					Maximum	51.5			Maximum of Log Data			3.942
359					Mean	21.63			Mean of log Data			2.844
360					Geometric Mean	17.19			SD of log Data			0.788
361					Median	19.27						
362					SD	14.04						
363					Std. Error of Mean	4.679						
364					Coefficient of Variation	0.649						
365					Skewness	1.024						

	A	B	C	D	E	F	G	H	I	J	K	L
366												
367												
368	Warning: There are only 9 Values in this data											
369	Note: It should be noted that even though bootstrap methods may be performed on this data set,											
370	the resulting calculations may not be reliable enough to draw conclusions											
371												
372	The literature suggests to use bootstrap methods on data sets having more than 10-15 observations.											
373												
374	Relevant UCL Statistics											
375	Normal Distribution Test						Lognormal Distribution Test					
376					Shapiro Wilk Test Statistic	0.909				Shapiro Wilk Test Statistic		0.902
377					Shapiro Wilk Critical Value	0.829				Shapiro Wilk Critical Value		0.829
378	Data appear Normal at 5% Significance Level						Data appear Lognormal at 5% Significance Level					
379												
380	Assuming Normal Distribution						Assuming Lognormal Distribution					
381					95% Student's-t UCL	30.33				95% H-UCL		50.94
382	95% UCLs (Adjusted for Skewness)									95% Chebyshev (MVUE) UCL		48.94
383					95% Adjusted-CLT UCL (Chen-1995)	31.03				97.5% Chebyshev (MVUE) UCL		60.38
384					95% Modified-t UCL (Johnson-1978)	30.59				99% Chebyshev (MVUE) UCL		82.87
385												
386	Gamma Distribution Test						Data Distribution					
387					k star (bias corrected)	1.628	Data appear Normal at 5% Significance Level					
388					Theta Star	13.28						
389					MLE of Mean	21.63						
390					MLE of Standard Deviation	16.95						
391					nu star	29.31						
392					Approximate Chi Square Value (.05)	17.95	Nonparametric Statistics					
393					Adjusted Level of Significance	0.0231				95% CLT UCL		29.32
394					Adjusted Chi Square Value	16.1				95% Jackknife UCL		30.33
395										95% Standard Bootstrap UCL		28.99
396					Anderson-Darling Test Statistic	0.372				95% Bootstrap-t UCL		31.99
397					Anderson-Darling 5% Critical Value	0.729				95% Hall's Bootstrap UCL		38.45
398					Kolmogorov-Smirnov Test Statistic	0.207				95% Percentile Bootstrap UCL		29.28
399					Kolmogorov-Smirnov 5% Critical Value	0.282				95% BCA Bootstrap UCL		30.6
400	Data appear Gamma Distributed at 5% Significance Level									95% Chebyshev(Mean, Sd) UCL		42.02
401										97.5% Chebyshev(Mean, Sd) UCL		50.85
402	Assuming Gamma Distribution									99% Chebyshev(Mean, Sd) UCL		68.18
403					95% Approximate Gamma UCL (Use when n >= 40)	35.31						
404					95% Adjusted Gamma UCL (Use when n < 40)	39.36						
405												
406	Potential UCL to Use									Use 95% Student's-t UCL		30.33
407												
408	ote: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UC											
409	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
410	and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.											
411												