

	A	B	C	D	E	F	G	H	I	J	K	L
1	User Selected Options			Background Statistics for Data Sets with Non-Detects								
2												
3	Date/Time of Computation			8/2/2013 12:21:41 PM								
4	From File			WorkSheet.xls								
5	Full Precision			OFF								
6	Confidence Coefficient			95%								
7	Coverage			95%								
8	rent or Future K Observations			1								
9	mber of Bootstrap Operations			2000								
10												
11	Aroclor											
12												
13	General Statistics											
14	Total Number of Observations				38	Number of Missing Observations						0
15	Number of Distinct Observations				32							
16	Number of Detects				15	Number of Non-Detects						23
17	Number of Distinct Detects				14	Number of Distinct Non-Detects						18
18	Minimum Detect				4.95	Minimum Non-Detect						1.3
19	Maximum Detect				10.93	Maximum Non-Detect						9.8
20	Variance Detected				2.841	Percent Non-Detects						60.53%
21	Mean Detected				7.267	SD Detected						1.686
22	Mean of Detected Logged Data				1.96	SD of Detected Logged Data						0.223
23												
24	Critical Values for Background Threshold Values (BTVs)											
25	Tolerance Factor K (For UTL)				2.132	d2max (for USL)						2.846
26												
27	Normal GOF Test on Detects Only											
28	Shapiro Wilk Test Statistic				0.93	Shapiro Wilk GOF Test						
29	5% Shapiro Wilk Critical Value				0.881	Detected Data appear Normal at 5% Significance Level						
30	Lilliefors Test Statistic				0.163	Lilliefors GOF Test						
31	5% Lilliefors Critical Value				0.229	Detected Data appear Normal at 5% Significance Level						
32	Detected Data appear Normal at 5% Significance Level											
33												
34	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
35	Mean				3.771	SD						3.105
36	95% UTL95% Coverage				10.39	95% KM UPL (t)						9.078
37	90% KM Percentile (z)				7.75	95% KM Percentile (z)						8.879
38	99% KM Percentile (z)				10.99	95% KM USL						12.61
39												
40	DL/2 Substitution Background Statistics Assuming Normal Distribution											
41	Mean				3.739	SD						3.193
42	95% UTL95% Coverage				10.55	95% UPL (t)						9.196
43	90% Percentile (z)				7.831	95% Percentile (z)						8.991
44	99% Percentile (z)				11.17	95% USL						12.83
45	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
46												
47	Gamma GOF Tests on Detected Observations Only											
48	A-D Test Statistic				0.322	Anderson-Darling GOF Test						
49	5% A-D Critical Value				0.735	etected data appear Gamma Distributed at 5% Significance Lev						
50	K-S Test Statistic				0.158	Kolmogrov-Smirnoff GOF						
51	5% K-S Critical Value				0.221	etected data appear Gamma Distributed at 5% Significance Lev						
52	Detected data appear Gamma Distributed at 5% Significance Level											
53												
54	Gamma Statistics on Detected Data Only											
55	k hat (MLE)				21.24	k star (bias corrected MLE)						17.03
56	Theta hat (MLE)				0.342	Theta star (bias corrected MLE)						0.427
57	nu hat (MLE)				637.1	nu star (bias corrected)						511
58	MLE Mean (bias corrected)				7.267							
59	MLE Sd (bias corrected)				1.761	95% Percentile of Chisquare (2k)						48.68
60												
61	Gamma ROS Statistics using Imputed Non-Detects											
62	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											

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63	GROS may not be used when kstar of detected data is small such as < 0.1													
64	For such situations, GROS method tends to yield inflated values of UCLs and BTVs													
65	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates													
66	Minimum					1.992	Mean					4.849		
67	Maximum					10.93	Median					4.007		
68	SD					2.286	CV					0.471		
69	k hat (MLE)					5.205	k star (bias corrected MLE)					4.812		
70	Theta hat (MLE)					0.931	Theta star (bias corrected MLE)					1.008		
71	nu hat (MLE)					395.6	nu star (bias corrected)					365.7		
72	MLE Mean (bias corrected)					4.849	MLE Sd (bias corrected)					2.21		
73	95% Percentile of Chisquare (2k)					17.79	90% Percentile					7.809		
74	95% Percentile					8.962	99% Percentile					11.4		
75	The following statistics are computed using Gamma ROS Statistics on Imputed Data													
76	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods													
77						WH	HW						WH	HW
78	Approx. Gamma UTL with 95% Coverage					10.51	10.67	95% Approx. Gamma UPL					9.053	9.12
79	95% Gamma USL					13.3	13.73							
80														
81	The following statistics are computed using gamma distribution and KM estimates													
82	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods													
83	k hat (KM)					1.474	nu hat (KM)					112		
84						WH	HW						WH	HW
85	Approx. Gamma UTL with 95% Coverage					12.71	13.28	95% Approx. Gamma UPL					10.02	10.24
86	95% Gamma USL					18.27	19.9							
87														
88	Lognormal GOF Test on Detected Observations Only													
89	Shapiro Wilk Test Statistic					0.963	Shapiro Wilk GOF Test							
90	5% Shapiro Wilk Critical Value					0.881	Detected Data appear Lognormal at 5% Significance Level							
91	Lilliefors Test Statistic					0.145	Lilliefors GOF Test							
92	5% Lilliefors Critical Value					0.229	Detected Data appear Lognormal at 5% Significance Level							
93	Detected Data appear Lognormal at 5% Significance Level													
94														
95	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects													
96	Mean in Original Scale					5.263	Mean in Log Scale					1.603		
97	SD in Original Scale					1.966	SD in Log Scale					0.332		
98	95% UTL95% Coverage					10.09	95% BCA UTL95% Coverage					10.93		
99	95% Bootstrap (%) UTL95% Coverage					10.93	95% UPL (t)					8.767		
100	90% Percentile (z)					7.606	95% Percentile (z)					8.582		
101	99% Percentile (z)					10.76	95% USL					12.79		
102														
103	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution													
104	KM Mean of Logged Data					0.967	95% KM UTL (Lognormal)95% Coverage					15.97		
105	KM SD of Logged Data					0.846	95% KM UPL (Lognormal)					11.17		
106	95% KM Percentile Lognormal (z)					10.58	95% KM USL (Lognormal)					29.23		
107														
108	Background DL/2 Statistics Assuming Lognormal Distribution													
109	Mean in Original Scale					3.739	Mean in Log Scale					0.881		
110	SD in Original Scale					3.193	SD in Log Scale					0.992		
111	95% UTL95% Coverage					20	95% UPL (t)					13.15		
112	90% Percentile (z)					8.603	95% Percentile (z)					12.33		
113	99% Percentile (z)					24.25	95% USL					40.61		
114	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.													
115														
116	Nonparametric Distribution Free Background Statistics													
117	Data appear to follow a Discernible Distribution at 5% Significance Level													
118														
119	Nonparametric Uppper Limits for BTVs(no distinction made between detects and nondetects)													
120	Order of Statistic, r					38	95% UTL with95% Coverage					10.93		
121	Approximate f					2	Confidence Coefficient (CC) achieved by UTL					0.858		
122	95% UPL					10.09	95% USL					10.93		
123	95% KM Chebyshev UPL					17.48								
124														

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125	Note: The use of USL to estimate a BTV is recommended only when the data set represents a background											
126	data set free of outliers and consists of observations collected from clean unimpacted locations.											
127	The use of USL tends to provide a balance between false positives and false negatives provided the data											
128	represents a background data set and when many onsite observations need to be compared with the BTV.											
129												