

MW-111 TCE											
General Statistics											
Total Number of Observations					6	Number of Distinct Observations				5	
Number of Detects					4	Number of Non-Detects				2	
Number of Distinct Detects					3	Number of Distinct Non-Detects				2	
Minimum Detect					0.74	Minimum Non-Detect				0.2	
Maximum Detect					1.2	Maximum Non-Detect				0.69	
Variance Detects					0.0477	Percent Non-Detects				33.33%	
Mean Detects					1.06	SD Detects				0.218	
Median Detects					1.15	CV Detects				0.206	
Skewness Detects					-1.74	Kurtosis Detects				2.968	
Mean of Logged Detects					0.0397	SD of Logged Detects				0.231	
Note: Sample size is small (e.g., <10), if data are collected using incremental sampling methodology (ISM) approach,											
refer also to ITRC Tech Reg Guide on ISM (ITRC 2020 and ITRC 2012) for additional guidance,											
but note that ITRC may recommend the t-UCL or the Chebyshev UCL for small sample sizes (n < 7).											
The Chebyshev UCL often results in gross overestimates of the mean.											
Refer to the ProUCL 5.2 Technical Guide for a discussion of the Chebyshev UCL.											
Normal GOF Test on Detects Only											
Shapiro Wilk Test Statistic					0.774	Shapiro Wilk GOF Test					
1% Shapiro Wilk Critical Value					0.687	Detected Data appear Normal at 1% Significance Level					
Lilliefors Test Statistic					0.323	Lilliefors GOF Test					
1% Lilliefors Critical Value					0.413	Detected Data appear Normal at 1% Significance Level					
Detected Data appear Normal at 1% Significance Level											
Note GOF tests may be unreliable for small sample sizes											
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs											
KM Mean					0.773	KM Standard Error of Mean				0.205	
90KM SD					0.434	95% KM (BCA) UCL				N/A	
95% KM (t) UCL					1.185	95% KM (Percentile Bootstrap) UCL					N/A
95% KM (z) UCL					1.11	95% KM Bootstrap t UCL				N/A	
90% KM Chebyshev UCL					1.387	95% KM Chebyshev UCL				1.665	
97.5% KM Chebyshev UCL					2.051	99% KM Chebyshev UCL				2.808	
Gamma GOF Tests on Detected Observations Only											
A-D Test Statistic					0.641	Anderson-Darling GOF Test					
5% A-D Critical Value					0.657	Detected data appear Gamma Distributed at 5% Significance Level					

K-S Test Statistic				0.352	Kolmogorov-Smirnov GOF					
5% K-S Critical Value				0.394	Detected data appear Gamma Distributed at 5% Significance Level					
Detected data appear Gamma Distributed at 5% Significance Level										
Note GOF tests may be unreliable for small sample sizes										
Gamma Statistics on Detected Data Only										
k hat (MLE)				27.11	k star (bias corrected MLE)				6.944	
Theta hat (MLE)				0.0391	Theta star (bias corrected MLE)				0.153	
nu hat (MLE)				216.9	nu star (bias corrected)				55.55	
Mean (detects)				1.06						
Gamma ROS Statistics using Imputed Non-Detects										
GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)										
For such situations, GROS method may yield incorrect values of UCLs and BTVs										
This is especially true when the sample size is small.										
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
Minimum				0.598	Mean				0.906	
Maximum				1.2	Median				0.92	
SD				0.293	CV				0.323	
k hat (MLE)				10.97	k star (bias corrected MLE)				5.598	
Theta hat (MLE)				0.0826	Theta star (bias corrected MLE)				0.162	
nu hat (MLE)				131.7	nu star (bias corrected)				67.17	
Adjusted Level of Significance (β)										
Approximate Chi Square Value (67.17, α)					49.31	Adjusted Chi Square Value (67.17, β)				43.83
95% Gamma Approximate UCL					1.234	95% Gamma Adjusted UCL				N/A
Estimates of Gamma Parameters using KM Estimates										
Mean (KM)				0.773	SD (KM)				0.434	
Variance (KM)				0.188	SE of Mean (KM)				0.205	
k hat (KM)				3.177	k star (KM)				1.7	
nu hat (KM)				38.13	nu star (KM)				20.4	
theta hat (KM)				0.243	theta star (KM)				0.455	
80% gamma percentile (KM)					1.18	90% gamma percentile (KM)				1.563
95% gamma percentile (KM)					1.933	99% gamma percentile (KM)				2.76
Gamma Kaplan-Meier (KM) Statistics										
Approximate Chi Square Value (20.40, α)					11.14	Adjusted Chi Square Value (20.40, β)				8.783
95% KM Approximate Gamma UCL					1.415	95% KM Adjusted Gamma UCL				1.796

Lognormal GOF Test on Detected Observations Only												
Shapiro Wilk Test Statistic				0.752	Shapiro Wilk GOF Test							
10% Shapiro Wilk Critical Value				0.792	Detected Data Not Lognormal at 10% Significance Level							
Lilliefors Test Statistic				0.345	Lilliefors GOF Test							
10% Lilliefors Critical Value				0.346	Detected Data appear Lognormal at 10% Significance Level							
Detected Data appear Approximate Lognormal at 10% Significance Level												
Note GOF tests may be unreliable for small sample sizes												
Lognormal ROS Statistics Using Imputed Non-Detects												
Mean in Original Scale				0.911	Mean in Log Scale					-0.137		
SD in Original Scale				0.287	SD in Log Scale					0.328		
95% t UCL (assumes normality of ROS data)				1.146	95% Percentile Bootstrap UCL					N/A		
95% BCA Bootstrap UCL				N/A	95% Bootstrap t UCL					N/A		
95% H-UCL (Log ROS)				1.283								
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution												
KM Mean (logged)				-0.51	KM Geo Mean					0.6		
KM SD (logged)				0.794	95% Critical H Value (KM-Log)					3.459		
KM Standard Error of Mean (logged)				0.374	95% H-UCL (KM -Log)					2.813		
KM SD (logged)				0.794	95% Critical H Value (KM-Log)					3.459		
KM Standard Error of Mean (logged)				0.374								
DL/2 Statistics												
DL/2 Normal					DL/2 Log-Transformed							
Mean in Original Scale				0.781	Mean in Log Scale					-0.535		
SD in Original Scale				0.471	SD in Log Scale					0.988		
95% t UCL (Assumes normality)				1.168	95% H-Stat UCL					5.804		
DL/2 is not a recommended method, provided for comparisons and historical reasons												
Nonparametric Distribution Free UCL Statistics												
Detected Data appear Normal Distributed at 1% Significance Level												
Suggested UCL to Use												
95% KM (t) UCL				1.185								
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.												
Recommendations are based upon data size, data distribution, and skewness using results from simulation studies.												
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.												