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PROUCL BACKGROUND EVALUATION MCRD PARRIS ISLAND SC
05/06/2016
RESOLUTION CONSULTANTS

PROUCL BACKGROUND EVALUATION, MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Prepared for:

Department of the Navy
Naval Facilities Engineering Command, Mid-Atlantic
9742 Maryland Avenue
Norfolk, Virginia 23511-3095

MARINE CORPS RECRUIT DEPOT
PARRIS ISLAND, SOUTH CAROLINA

Contract Number N62470-11-D-8013
CTO JM03

May 2016

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MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA

Revision Number: 0

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9742 Maryland Avenue
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Marine Corps Recruit Depot
Parris Island, South Carolina

Prepared by:

Resolution Consultants
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Contract Task Order Manager

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MEMORANDUM

To: Lila Llamas, United States Environmental Protection Agency, Federal Facilities Branch, Superfund Division

Meredith Amick, PE, South Carolina Department of Health and Environmental Control, Department of Defense Corrective Action Section, Division of Waste Management

Jose Parra, Department of the Navy, Naval Facilities Engineering Command Mid-Atlantic

Tim Harrington, Marine Corps Recruit Depot Parris Island, G-4 Installation & Logistics, Natural Resources & Environmental Affairs Office

From: Resolution Consultants

Date: 6 May 2016

Re: **ProUCL Background Evaluation, Marine Corps Recruit Depot Parris Island, South Carolina**

Resolution Consultants, on behalf of Naval Facilities Engineering Command Mid-Atlantic, under Contract Task Order JM03 of the Comprehensive Long-Term Environmental Action Navy IV Program (Contract Number N62470-11-D-8013), has prepared this memorandum to update background threshold values (BTVs) associated with soil and sediment analytical background data to be used during Environmental Restoration Program investigations at Marine Corps Recruit Depot (MCRD) Parris Island, South Carolina. As agreed upon by the MCRD Parris Island Partnering Team, the existing soil and sediment background data for Marine Corps Air Station (MCAS) Beaufort is used for Environmental Restoration Program investigations at MCRD Parris Island. This background dataset is used in the process of determining whether detected concentrations are attributable to site-related activities or natural/anthropogenic sources. During recent discussions by the MCRD Parris Island Partnering Team, it was determined that the existing background dataset should be updated using the most recent United States Environmental Protection Agency (U.S. EPA) ProUCL Version 5.0 methodology and software (ProUCL). Following a brief discussion on historical background studies, this memorandum summarizes the methodology and results associated with the update of BTVs using ProUCL.

RESOLUTION CONSULTANTS

HISTORICAL BACKGROUND STUDIES

The basewide background dataset for MCAS Beaufort was established in the *RCRA Facility Investigation Report for Solid Waste Management Unit 3, Borrow Pit Landfill, Marine Corps Air Station Beaufort, Appendix Z Basewide Background Report* (Tetra Tech NUS [Tetra Tech], 2006). The background dataset includes a total of 66 results for soil sample locations (including six field duplicates), except benzaldehyde (see Methodology section below), and 11 results for sediment sample locations (including one field duplicate). Background samples were collected from areas reported as locations that have not been impacted by MCAS Beaufort waste management activities or base operations (Tetra Tech, 2006). The soil evaluation included both surface (0 to 1 foot below ground surface) and subsurface (2 to 3 feet below ground surface) samples from "sandy soil" and "silty-to-clayey sand soil"). These depths were chosen by the authors to represent surface and vadose zone soils, respectively (Tetra Tech, 2006). Sediment samples were collected from surface depth only (0 to 1 foot below ground surface). Background samples were analyzed for total compound list (TCL) volatile organic compounds, TCL semi-volatile organic compounds, TCL pesticides, TCL polychlorinated biphenyls, chlorinated herbicides, and total analyte list metals. Following data evaluation via quantitative and qualitative statistical tests, the following general conclusions were derived during the 2006 study:

- Sediment chemical concentration data were deemed statistically different from surface and subsurface soil chemical concentration data and thus were considered a separate dataset.

- Surface soil data were statistically similar to subsurface soil data from each of the three soil types and thus were considered as one dataset for background soil comparisons.

- Data for the three soil types were statistically similar and thus were considered as one dataset for background soil comparisons.

The MCAS Beaufort 2006 background study used several statistical tests to determine the distribution of the dataset for each chemical to allow for calculation of the appropriate representative concentration of each chemical. In 2006, the representative background concentration for a chemical was either the 95-percent upper confidence limit (UCL) or the maximum concentration, based on professional judgment as presented in the 2006 background study (Tetra Tech, 2006). The methods used to update background values are described below.

METHODOLOGY

As determined by the MCRD Parris Island Partnering Team, the objective of this background evaluation is to update the existing MCAS Beaufort background values using the dataset from the 2006 background study and the most recent U.S. EPA ProUCL methodology and software (U.S. EPA, 2014a). Overall, BTVs were derived using ProUCL and existing background data. The process included several steps to select a BTV for compounds in the background dataset. BTVs are estimates of the upper bound background concentration. Goodness-of-Fit (GOF) evaluations were used to identify appropriate data distributions, and data were evaluated for outliers. The data were subsequently managed to address data variability, non-detected values, and outliers that were identified. Values identified as BTVs were either upper tolerance limits (UTLs) or upper simultaneous limits (USLs), depending on ProUCL recommendations, input from the partnering team, and professional judgment, as discussed in the subsections below.

Data Management

The comprehensive ProUCL dataset included in Appendix A was formatted to facilitate uploading the data into ProUCL software and presents results using two columns for each analyte per sample.[1] The first column presents the respective concentration for the given analyte. The second column, which includes a "D" prefix, uses a value of "1" to indicate a compound was detected, and a value of "0" for compounds that were not detected.

Some data management was necessary to address estimated ("J" flagged) results and non-detected ("U" flagged) results in the dataset. The "J" flagged results are values above the limit of detection (also known as the method detection limit), for which there is a 99 percent confidence that the result is greater than zero but less than the practical quantitation limit.[2] The "J" flagged values are considered estimates for the purpose of this project and were used as detected concentrations at their estimated value.[3] Additionally, the partnering team determined that field duplicate results would be included as discreet samples to provide for a more robust dataset. The non-detects are "U" flagged values that are less than the limit of detection, and the result is considered to be between zero and the limit of detection. Rejected data ("R" flagged) from previous background studies were not included. This affected the benzaldehyde soil dataset, in which all but four concentrations were rejected. Benzaldehyde was the only compound that had both positive detections and rejected results. This compound was retained in the soil dataset. Total polycyclic aromatic hydrocarbons (PAHs) were evaluated as a single parameter in the historical dataset, but distinctions between total low molecular weight (LMW) and total high molecular weight (HMW) PAHs were not included in the historical dataset.

[1] Appendix A is formatted in accordance with the ProUCL User's Guide.
[2] The lowest concentration that can be reliably measured within specified limits of precision and accuracy for a specific laboratory analytical method.
[3] Estimated concentrations in this document are those for which only part of the measurement is known, e.g., the presence of a compound is known, but the concentration is not known. The concentration is greater than the detection limit, but less than the practical quantitation limit and is estimated; thus, the value reported was used as a detected concentration.

During discussions with U.S. EPA, it was determined that calculating total LMW and HMW PAHs would be useful for consistency with current ecological soil screening levels and corresponding guidance, so the partnering team decided to generate LMW/HMW concentrations from the individual reported PAHs in the historical dataset to satisfy current ecological assessment standards (U.S. EPA, 2007). Per U.S. EPA Office of Solid Waste and Emergency Response technical guidance, a LMW PAH is defined as any PAH that has fewer than four aromatic rings, and a HMW PAH is defined as any PAH that has four or more aromatic rings (U.S. EPA, 2007). Of the thirteen PAHs evaluated in the soil background study, three of them are considered LMW PAH, and the other ten are considered HMW PAH.

If at least one PAH had a positive detection at a sample location, the total LMW or total HMW PAH at that location was considered to be a positive detection. The concentrations of total LMW and total HMW PAH were calculated as the sum of each detected LMW or HMW PAH in the soil dataset, including one-half the value of each non-detected LMW or HMW PAH. The LMW PAH dataset included three positive detections, and the HMW PAH dataset had four positive detections.

The sum of individual PAH compounds in the soil dataset were greater than the Total PAH recorded in the historical soil dataset reported in 2006 (Tetra Tech, 2006). For this reason, a "New Total PAH" parameter was developed to compare with the historical Total PAH and to determine a corresponding BTV. PAHs were not detected in sediment, so Total PAH was not applicable in sediment. Appendix D documents information for PAHs, Appendix D1 shows the calculated LMW PAH, HMW PAH, and "New Total PAH," and Appendices D2 and D3 summarize PAH data.

Goodness-of-Fit Tests

When estimating population parameters such as UTLs and USLs, the distribution of the data, data skewness, and presence of non-detected data must be considered, in accordance with ProUCL guidance (U.S. EPA, 2013b). The first step in determining which statistical method is appropriate to estimate population parameters is to determine if the dataset is from a known distribution. ProUCL GOF testing was used to determine the most appropriate distribution and corresponding statistical methods to calculate BTVs.

ProUCL software makes specific recommendations regarding the appropriate data distribution as part of the UCL calculation output. When calculating a BTV, these same recommendations are applicable, but are not explicitly included in the software output.

Therefore, UCL calculations were generated in ProUCL to obtain recommendations from the software regarding the distribution, and those recommendations were applied to BTV calculations to select the appropriate BTV. As part of that process, GOF testing and BTV estimates were developed using methods that included non-detect values in accordance with ProUCL guidance (U.S. EPA, 2013a; U.S. EPA 2013b).

U.S. EPA *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* indicates that nonparametric methods may be used to avoid the necessity of imputing surrogate values for non-detect measurement (U.S. EPA, 2002). Similarly, since it is not easy to reliably perform GOF tests on some datasets (e.g., those that have few positive detections), ProUCL sometimes recommends the use of distribution-free nonparametric methods to estimate BTVs[4] (U.S. EPA, 2013b). Additionally, U.S. EPA Guidance indicates that nonparametric methods are useful when developing background values (U.S. EPA, 2002; U.S. EPA, 2013b). When ProUCL software is unable to discern a distribution, such as datasets that are mostly non-detects, a nonparametric BTV is used in accordance with U.S. EPA ProUCL guidance, U.S. EPA *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, and U.S. EPA March 2009 *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities — Unified Guidance*, EPA 530/R-09-007, and the U.S. EPA ProUCL Technical Guide (U.S. EPA, 2002: U.S. EPA, 2009; U.S. EPA, 2013b). Further, U.S. EPA *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* and U.S. Navy *Guidance for Environmental Background Analysis* indicate that when more than 50 percent of the measurements in the dataset are non-detect, descriptive statistics do not provide much insight into the underlying distribution (U.S. EPA, 2000; U.S. Navy, 2002). Thus, nonparametric statistics were used for compounds with too few results to calculate a discernable distribution.

For datasets with a limited number of detected values, the nonparametric USL was used as the BTV. When nonparametric methods were used, corresponding notes were added to the results section and summary tables below. When nonparametric methods were used for datasets with less than three detections, notes were added to summary tables to indicate additional data collected from background locations for such compounds will be considered on a case-by-case basis. The GOF results and recommended data distributions are documented in Appendix C. See Appendices C5 and C13 for soil and sediment, respectively. Responses to regulatory comments associated with previous versions of this evaluation, and a summary of notes from the 30 April 2015 teleconference, are included in Appendix E.

[4] Site-specific background threshold values, determined as a UTL, USL or other upper bound background concentration

Outliers

ProUCL guidance indicates outliers can distort estimates of population statistics and recommends that the data is from a single background population and is free of outliers (U.S. EPA, 2013a; U.S. EPA, 2013b). Statistical analysis of the data operates under this implicit assumption. The USL[5] and UTL[6] are statistics calculated by ProUCL based upon an established background dataset, and their calculation depends upon the data distribution and outliers identified in the dataset (U.S. EPA, 2013a). Normal, lognormal, and gamma distribution USL calculations are explicitly stated in the ProUCL guidance and output. The USL can be used as the BTV after removing outliers, and the UTL is sometimes used instead of the USL, as described below (U.S. EPA, 2013b). For nonparametric datasets, the maximum detected value is used as a nonparametric USL and as the estimated BTV.

Per ProUCL guidance, it is the partnering team's decision to use or exclude outliers (U.S. EPA, 2013a). Consequently, tables are provided herein to facilitate the decision. ProUCL recommends using all existing site knowledge and reference areas that are being investigated, rather than relying strictly on statistical calculations (U.S. EPA, 2013b). It should be noted that the removal of possible outliers from the upper end of the range of concentrations results in lower/more conservative BTVs. For the purposes of this evaluation, the following steps were used to review outliers:

1. In accordance with ProUCL guidance, the Dixon Test was used to review datasets with less than 25 observations and the Rosner Test was used to review datasets with greater than 25 observations (U.S. EPA, 2013a). ProUCL software determined which test was appropriate for each dataset and generally used the 90 or 95 percent confidence level to identify outliers.

2. Outliers identified by ProUCL were confirmed using Q-Q plots developed in ProUCL. Outliers confirmed as part of this visual evaluation process were noted in a summary table and were removed from the dataset. This process was repeated until no outliers were identified. The BTV was subsequently determined with the remaining data using ProUCL software.

3. Based on recommendations from U.S. EPA Region 4 during a 30 April 2015 conference call, USLs were compared to the outlier concentrations that were removed from datasets prior to calculating background values. If the USL was greater than the removed outliers, the UTL was used as the BTV. Otherwise, the USL was used as the BTV.

[5] The upper boundary of the largest value.
[6] A confidence limit on a percentile of the population rather than a confidence limit on the mean.

4. ProUCL software could not perform GOF testing or other statistical analyses for compounds with a low number of detections (i.e., greater than 95 percent non-detects or three or less detections). U.S. EPA *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* indicates that nonparametric methods may be used to avoid the necessity of imputing surrogate values for non-detect measurement (U.S. EPA, 2002). Consequently, probability plots were reviewed, and distribution free (nonparametric) statistics were used to develop BTVs for datasets with a low number of detections in accordance with U.S. EPA guidance (U.S. EPA, 2002; U.S. EPA, 2013a; U.S. EPA, 2013b). Nonparametric USLs were identified from datasets that excluded outliers when outliers were identified. As recommended during a 30 April 2015 teleconference, and subsequent 4 May 2015 email correspondence, between the U.S. EPA and the Navy, datasets with less than three detections will be considered on a case-by-case basis.

In summary, outlier tests using ProUCL identified several outliers in the dataset. Outlier test results are included in Appendix B, and the information is discussed on a case-by-case basis in the results section below. Appendix B1 documents seven iterations of outlier tests and soil results. Q-Q plots were developed in ProUCL when a Rosner or Dixon Test could not be performed, and the plots are also included in Appendix B2. Appendices B3 and B4 document sediment outlier tests and sediment Q-Q plots, respectively. Appendix D4 documents outlier tests and Q-Q plots for the calculated LMW PAH, HMW PAH, and Total PAH parameters in the soil dataset.

Data Variability

Some statistical tests are influenced by data variability and result in BTVs greater than the maximum reported concentration. As previously discussed, the BTV is an estimate of the upper bound background concentration, so BTV results greater than the maximum reported values were anticipated based on ProUCL guidance, and in accordance with ProUCL guidance, these results were retained as BTVs if the statistical tests and software recommended using those BTVs.

As previously discussed, ProUCL software sometimes selects the nonparametric USL as the BTV, which is consistent with the U.S. EPA *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites*, which indicates nonparametric methods are useful when developing background values (U.S. EPA, 2002; U.S. EPA, 2013b). Nonparametric statistics were used for compounds with three or less results. For those datasets, the nonparametric USL was used as the BTV.

In summary, the ProUCL Technical Guide indicates that, when numerous values need to be compared with a BTV, UTLs or USLs are recommended for use as BTVs to control the false positive error rate (Type I Error Rate) (U.S. EPA, 2013b). GOF tests, outliers, and other factors were considered and discussed in this memorandum, and details are documented in Appendices B through D. Outlier information is included in Appendix B. Data and ProUCL GOF output data, ProUCL distribution recommendations, BTV calculations, and more are included as Appendix C. Appendices C1 through C8 provide information for soil, and Appendices C9 through C16 provides information for sediment. The cover pages for Appendix C include content lists. Appendix D provides documentation for PAHs.

RESULTS

In accordance with ProUCL guidance, background statistics were developed for the dataset, excluding outliers. As discussed during the December 2014 MCRD Parris Island Partnering Team meeting, background concentrations can be higher than risk based concentrations. During a subsequent 30 April 2015 phone conversation between U.S. EPA, NAVFAC Mid-Atlantic, and Resolution Consultants, U.S. EPA clarified that in accordance with The U.S. EPA Region 4 Draft Final Human Health Risk Assessment Supplemental Guidance the background screening process is used to eliminate compounds as part of the screening process for identifying chemicals of potential concern for human health risk assessments, which will prevent compounds that are eliminated through the background screening process from being carried through to a Baseline Risk Assessment (U.S. EPA, 2014). Furthermore, in accordance with U.S. EPA Region 4 Ecological Risk Assessment Supplemental Guidance, 2015 Interim Draft, background screening is also used to refine the chemicals of potential concern as part of Step 3a in ecological risk assessments, which will prevent compounds that are eliminated through the background screening process from being carried through to a Baseline Ecological Risk Assessment. Therefore, U.S. EPA Region 4 considers risk based concentrations during review and approval of background concentrations, ensuring that an appropriate background value is established. Summary notes from the 30 April 2015 teleconference, and responses to regulatory comments associated with previous versions of this evaluation, are included in Appendix E.

Soil

Outliers were identified and are summarized in Table 1. For some compounds, including HMW PAH and Total PAH, ProUCL outlier testing was performed until results indicated no outliers remained in the dataset, or ProUCL was unable to perform additional outlier tests (e.g., due to limited numbers of detected data). A separate dataset was developed that identified and excluded outlying data, and additional details are provided in Appendix C. Documentation for LMW PAH, HMW PAH, and Total PAH is provided in Appendix D.

The small number of detected values in this group of compounds limits the ability to identify outliers. Three or fewer detected results were reported for the following compounds:

- 2,4-D
- 4,4'-DDD
- Anthracene
- Benzaldehyde
- Benzo(a)anthracene
- Benzo(g,h,i)perylene
- Carbazole
- Chrysene
- Dalapon
- Dibenz(a,h)anthracene
- Dichlorodifluoromethane
- Endosulfan Sulfate
- Endrin
- Endrin Aldehyde
- Gamma-Chlordane
- Heptachlor
- Indeno(1,2,3-cd)pyrene
- LMW PAH
- Methoxychlor
- Methyl Acetate
- Phenanthrene
- Pyrene
- Silver
- Thallium

Table 2 summarizes BTVs for soil. As previously discussed, if outlier test methods could not be used to delineate outliers, a nonparametric method was used to select BTVs. Therefore, nonparametric USLs were selected as BTVs for the compounds listed above. Appendix Table C7 indicates that the USLs for arsenic, cobalt, lead, manganese, and nickel were higher than the lowest outlier identified in their respective datasets. Consequently, UTLs were selected as BTVs for these compounds based on recommendations from U.S. EPA and professional judgment.

Sediment

A sediment dataset was developed that identified and excluded outlying data. As documented by outlier tests and confirmed using Q-Q plots in Appendices B3 and B4, ProUCL identified seven outliers in sediment datasets for barium, beryllium, copper, endrin ketone, selenium, and zinc, as summarized in Table 1.

The sediment dataset contained 11 total samples for each compound. Methyl acetate and methoxychlor were reported in few samples. Methyl acetate was reported in only one sample, so no plots or outlier tests could be performed for this analyte. Similarly, ProUCL could not perform outlier tests to evaluate methoxychlor, because the number of positive detections was too low, so a Q-Q plot was developed to visually evaluate the data. Nonparametric USLs for endrin ketone, selenium, methyl acetate, and methoxychlor were selected as BTVs because each parameter had less than three detected concentrations for these compounds and ProUCL could not determine a distribution based on that sample size.

Table 3 summarizes BTVs for sediment. Appendix C14 shows the USL and UTL statistics that were considered when selecting BTVs for the sediment dataset. Outliers were identified in the sediment datasets for beryllium and selenium, and they were lower tail outliers. These outliers were removed based on the statistical methods described above because those values may not represent the true sample set and may bias statistical analyses.

Additional Background Values and Other Data

Table 4 presents additional BTVs for soil, which would typically be used in the uncertainty section of a human health risk assessment or as part of the refinement Step 3a in an ecological risk assessment process to refine and identify chemicals of concern. Tables 5 and 6 present additional data collected from background sampling locations to be considered on a site-specific basis for soil and sediment, respectively. Additional data presented in Tables 5 and 6 are summarized separately from those in Tables 2 through 4, since the data in Tables 5 and 6 include more uncertainty and, thus, are for use on a case-by-case basis when a compound could otherwise be a driver for action, such as when Site data minimally exceed risk-based remedial goals (Use in any other scenario must be approved by U.S. EPA and SCDHEC). Use of additional data presented in Tables 5 and 6 should be discussed during scoping of the risk document and requires coordination with and approval from the MCRD Parris Island Partnering Team.

Table 1
Outliers Removed from Soil and Sediment Datasets
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

	Soil Dataset		Sediment Dataset	
Compound	**Result**	**Sample ID**	**Result**	**Sample ID**
Alpha-Chlordane	280	BEA-BG-SB-SSB-06-03		
	11.9	SCS-05_0-1		
	9.21	SSA-05_2-3		
Aluminum	12,100,000	SCS-01_2-3		
	10,900,000	SCS-02_2-3		
	10,200,000	BEA-BG-SB-SSB-02-03		
Arsenic	3,300	SCS-01_2-3		
Benzo(b)fluoranthene	1,900	SCS-01_0-1		
Benzo(k)fluoranthene	1,500	SCS-01_0-1		
Barium			18,600	CSA-04
Beryllium	288	SCS-03_0-1	165	CSA-09
	270	BEA-BG-SB-SSB-07-03		
	265	SCS-06_0-1		
Calcium	5,260,000	BEA-BG-SB-SSB-07-03		
	43,300,000	BEA-BG-SS-SSB-02-01		
	9,810,000	BEA-BG-SS-SSB-03-01		
	21,000,000	BEA-BG-SS-SSB-07-01		
Carbon Disulfide	230	SCS-04_2-3		
Chromium	10,100	BEA-BG-SB-SSB-07-03		
	11,800	SCS-01_2-3		
	14,300	SCS-02_2-3		
	13,800	SCS-10_2-3		
Cobalt	1,000	BEA-BG-SB-SSB-07-03		
	1,200	BEA-BG-SS-SSB-02-01		
	810	BEA-BG-SS-SSB-08-01		
	1,000	SCS-01_2-3		
	850	SCS-03_2-3		
Copper			23,000	CSA-03
Endrin Ketone			76.50	CSA-10
Fluoranthene	5,800	SCS-01_0-1		
Iron	11,200,000	SCS-01_2-3		
	8,000,000	SCS-10_2-3		
	7,990,000	SCS-02_2-3		
Lead	20,400	BEA-BG-SS-SSB-01-01		
	16,200	BEA-BG-SS-SSB-02-01		
	15,500	BEA-BG-SB-SSB-01-03		
	12,700	SCS-04_0-1		

Table 1
Outliers Removed from Soil and Sediment Datasets
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

	Soil Dataset		Sediment Dataset	
Compound	**Result**	**Sample ID**	**Result**	**Sample ID**
Magnesium	1,040,000	BEA-BG-SB-SSB-07-03		
	1,000,000	BEA-BG-SS-SSB-02-01		
	567,000	BEA-BG-SS-SSB-07-01		
Manganese	80,100	SCS-03_0-1		
	44,100	BEA-BG-SB-SSB-07-03		
	75,800	BEA-BG-SS-SSB-02-01		
	40,600	SCS-07_0-1		
	72,500	SCS-08_0-1		
Mercury	770	SCS-09_0-1		
Nickel	3,600	BEA-BG-SS-SSB-02-01		
Phenanthrene	3,200	SCS-01_0-1		
Potassium	570,000	BEA-BG-SB-SSB-07-03		
	390,000	BEA-BG-SS-SSB-02-01		
	282,000	BEA-BG-SS-SSB-07-01		
	199,000	BEA-BG-SS-SSB-08-01		
	216,000	SCS-01_2-3		
	208,000	SCS-10_2-3		
Total PAH*	25,670	SCS-01_0-1		
LMW PAH*	4,240	SCS-01_0-1		
HMW PAH*	21,430	SCS-01_0-1		
Selenium			1,120	CSA-09
Sodium	549,000	BEA-BG-SB-SSB-01-03		
	218,000	BEA-BG-SS-SSB-07-01		
Thallium	682	SCS-04_0-1		
Vanadium	23,200	SCS-01_2-3		
	16,900	SCS-02_2-3		
	22,300	SCS-10_2-3		
Zinc			55,200	CSA-07
			52,100	CSA-03

Notes:

Units are micrograms per kilogram (μg/kg)

PAH = Polycyclic aromatic hydrocarbons
LMW = Low molecular weight
HMW = High molecular weight

* Total PAH, LMW PAH, and HMW PAH were determined as shown in Appendix D4.

Table 2
Summary of Estimated Background Threshold Values for Soil
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	BTV	Notes
2,4'-D	See Table 5		
4,4'-DDD	See Table 5		
4,4'-DDE	Normal	6.4	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
4,4'-DDT	Normal	3.6	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Alpha-Chlordane[a]	Normal	5.2	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Aluminum[a]	Normal	9,200,000	ProUCL recommends normal distribution; 95% USL for normal distribution selected as BTV
Anthracene	See Table 5		
Arsenic	Gamma	2,190	ProUCL recommends gamma distribution; 95% WH UTL for gamma distribution selected as BTV
Barium	Approximate Normal	32,000	ProUCL recommends normal distribution; 95% USL for normal distribution selected as BTV
Benzaldehyde	See Table 5		
Benzo(a)anthracene	Nonparametric	2,200	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Benzo(a)pyrene	Normal	609	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Benzo(b)fluoranthene[a]	Nonparametric	540	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Benzo(g,h,i)perylene[a]	See Table 5		
Benzo(k)fluoranthene[a]	Nonparametric	520	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Beryllium[a]	Approximate Normal	247	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Cadmium	Normal	171	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Calcium[a]	Gamma	3,530,000	ProUCL recommends gamma distribution; 95% WH USL for gamma distribution and KM estimates selected as BTV
Carbazole	See Table 5		
Carbon Disulfide[a]	Nonparametric	100	ProUCL recommends nonparametric statistics; nonparametric 95% USL selected as BTV
Chromium	See Table 4		
Chrysene	Nonparametric	2,500	Low number of detected compounds; thus, a nonparametric USL was used as the BTV

Table 2
Summary of Estimated Background Threshold Values for Soil
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	BTV	Notes
Cobalt[a]	Gamma	632	ProUCL recommends gamma distribution; 95% gamma WH UTL for gamma distribution and ROS statistics selected as BTV
Copper	Normal	5,281	ProUCL recommends normal distribution; 95% USL for normal distribution selected as BTV
Dalapon	See Table 5		
Dibenz(a,h)anthracene	See Table 5		
Dichlorodifluoromethane	See Table 5		
Endosulfan Sulfate	Nonparametric	13.6	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Endrin	See Table 5		
Endrin Aldehyde	See Table 5		
Fluoranthene[a]	Nonparametric	920	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Gamma-Chlordane	See Table 5		
Heptachlor	See Table 5		
Indeno(1,2,3-CD)pyrene	See Table 5		
Iron[a]	Normal	5,900,000	ProUCL recommends normal distribution; 95% USL for normal distribution selected as BTV
Lead[a]	Gamma	9,150	ProUCL recommends gamma distribution; 95% WH UTL for gamma distribution selected as BTV
Magnesium[a]	Normal	375,000	ProUCL recommends normal distribution; 95% USL for normal distribution selected as BTV
Manganese[a]	Gamma	32,320	ProUCL recommends gamma distribution; 95% WH UTL for gamma distribution selected as BTV
Mercury[a]	Normal	506	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Methoxychlor	See Table 5		
Methyl Acetate	See Table 5		
Nickel[a]	Gamma	2,777	ProUCL recommends gamma distribution; 95% WH UTL for gamma distribution and KM estimates selected as BTV
Phenanthrene[a]	Nonparametric	390	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Potassium[a]	Approximate Normal	162,000	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV

Table 2
Summary of Estimated Background Threshold Values for Soil
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	BTV	Notes
Pyrene	Nonparametric	3,500	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Selenium	Gamma	1,300	ProUCL recommends gamma distribution; 95% WH USL for gamma distribution and KM estimates selected as BTV
Silver	Nonparametric	986	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Sodium[a]	Nonparametric	121,000	ProUCL recommends nonparametric statistics; nonparametric 95% USL selected as BTV
Thallium[a]	Nonparametric	386	Low number of detected compounds; thus, a nonparametric USL was used as the BTV; the maximum reported value was used rather than 417, which was the highest nondetect value and was the nonparametric USL in ProUCL; the lower value was used because that is more conservative when used for background comparisons
Total DDD/DDE/DDT	See Table 4		
Total PAH	See Table 4		
Trichlorofluoromethane	Normal	4.2	ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV
Vanadium[a]	Approximate Normal	12,100	ProUCL recommends normal distribution; 95% USL for normal distribution selected as BTV
Zinc	Lognormal	45,100	ProUCL recommends lognormal distribution; 95% KM USL for lognormal distribution with imputed non-detects selected as BTV

Notes:

All units are micrograms per kilogram (μg/kg)

BTV = Background threshold value
USL = ProUCL upper simultaneous level
UCL = Upper confidence level of the mean
KM = Kaplan-Meier
WH = Wilson Hilferty
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
a = Identified as containing outlier data by ProUCL; see Appendix B1

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Table 3
Summary of Estimated Background Threshold Values for Sediment
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	BTV	Notes
Aluminum	Gamma	11,600,000	ProUCL recommends gamma Distribution; 95% WH gamma USL selected as BTV
Arsenic	Normal	6,720	ProUCL recommends normal Distribution; 95% KM USL for normal distribution selected as BTV
Barium[a]	Normal	14,500	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Beryllium[a]	Nonparametric	416	Low number of detected compounds; thus, a nonparametric USL in ProUCL was used as the BTV.
Calcium	Normal	2,190,000	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Carbon Disulfide	Normal	1,840	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Chromium	Approximate Normal	16,700	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Cobalt	Normal	2,440	ProUCL recommends normal Distribution; 95% KM USL for normal distribution selected as BTV
Copper[a]	Approximate Normal	12,600	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Endrin Ketone[a]	Nonparametric	18.3	Low number of detected compounds; thus, a nonparametric USL was used as the BTV
Iron	Normal	12,300,000	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Lead	Normal	13,300	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Magnesium	Normal	4,110,000	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Manganese	Normal	70,100	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Mercury	Normal	330	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Methyl Acetate	See Table 6		
Methoxychlor	See Table 6		
Nickel	Normal	4,350	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Potassium	Gamma	3,410,000	ProUCL recommends gamma Distribution; 95% WH gamma USL selected as BTV
Selenium	See Table 6		
Sodium	Normal	16,200,000	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV
Vanadium	Normal	25,800	ProUCL recommends normal Distribution; 95% USL for normal distribution selected as BTV

Table 3
Summary of Estimated Background Threshold Values for Sediment
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	BTV	Notes
Zinc[a]	Approximate Lognormal	46,700	ProUCL recommends lognormal Distribution; 95% USL for background statistics assuming lognormal distribution selected as BTV

Notes:

All units are micrograms per kilogram (μg/kg)

BTV = Background threshold value

USL = ProUCL upper simultaneous level

UCL = Upper confidence level of the mean

KM = Kaplan-Meier

WH = Wilson Hilferty

a = Identified as containing outlier data by ProUCL; see Appendix B3

Table 4
Additional Background Threshold Values for Soil[1]
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	Site-Specific BTV	Rationale
Chromium[a]	Gamma	11,200	Total chromium results as reported by the analytical laboratory are not speciated and do not account for hexavalent chromium; human health risk screening will be performed using the U.S. EPA RSL for hexavalent chromium in accordance with U.S. EPA's November 2014 User's Guide for the RSLs. The background concentration for total chromium is appropriate for comparison to total chromium results, thus the total chromium background value has been moved to this table as recommended by U.S. EPA during the 16 December 2014 partnering team call. This information is also useful in ecological risk assessments because ecological screening values for total chromium are sometimes more conservative than those for hexavalent chromium. Additionally, the total chromium background value is useful at sites where hexavalent chromium is analyzed and is not detected. ProUCL recommends gamma distribution; 95% WH USL for gamma distribution selected as BTV.
Total DDD/DDE/DDT	Normal	9	Total DDD/DDE/DDT (total DDX) is sometimes used in ecological risk assessments to correspond with select benchmarks and as part of the weight of evidence when evaluating sites, so this background value could be useful in the future. As discussed during the 16 December 2014 partnering team call, the background value has been retained and moved to this table to facilitate ecological risk assessment. ProUCL recommends normal distribution; 95% KM USL for normal distribution selected as BTV.
Total PAH[b]	Nonparametric	5690	Total PAHs were historically used in ecological risk assessments as part of the weight of evidence when evaluating sites and could be useful for similar comparisons in the future. The "TOTAL_PAH" parameter in the historical dataset was outdated. Four concentrations were detected, and one was identified and removed as an outlier. Due to a low number of detected compounds, the nonparametric USL was used as the BTV; This BTV was developed using the "New Total PAH" parameter determined as shown in Appendix D1.
HMW PAHs[b, c]	Nonparametric	5190	HMW and LMW PAHs would be the primary ESVs used in screening level ecological risk assessments, so the total PAH value is outdated and would not be as useful as the totals for HMW and LMW PAHs that correspond with U.S. EPA's Ecological Soil Screening Levels guidance. Four concentrations were detected, and one was identified and removed as an outlier. Because there were only three detected concentrations in the dataset after removing the outlier, a nonparametric USL was used as the BTV.

Table 4
Additional Background Threshold Values for Soil[1]
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Distribution	Site-Specific BTV	Rationale
LMW PAHs[b, d]	Nonparametric	500	As previously discussed, HMW and LMW PAHs would be the primary ESVs used in screening level ecological risk assessments. Three concentrations were detected, and one was identified and removed as an outlier. Due to the low number of detected compounds, a nonparametric USL was used as the BTV.

Notes:

1 Table 4 presents additional BTVs for soil, which would typically be used in the uncertainty section of a human health risk assessment or as part of the refinement Step 3a in an ecological risk assessment process to refine and identify chemicals of concern.

LMW and HMW PAHs were determined according to Office of Solid Waste and Emergency Response Directive 9285.7-78 memorandum (June 2007). See table in Appendix D.

All units are micrograms per kilogram (µg/kg)

BTV = Background threshold value
USL = ProUCL upper simultaneous level
KM = Kaplan-Meier
WH = Wilson Hilferty
LMW = Low Molecular Weight
HMW = High Molecular Weight
PAH = Polycyclic aromatic hydrocarbons
ESVs = Ecological screening values
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene
DDT = Dichlorodiphenyltrichloroethane
a = Identified as containing outlier data by ProUCL; see Appendix B1
b = Identified as containing outlier data by ProUCL; See Appendix D4
c = High molecular weight PAH; see Appendix D
d = Low molecular weight PAH; see Appendix D

Table 5
Additional Data Collected from Background Soil Borings[1]
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Minimum Reported Concentration	Maximum Reported Concentration
2,4'-D	20	20
4,4'-DDD	1.8	1.8
Anthracene	77	590
Benzaldehyde	360	800
Benzo(g,h,i)perylene[a]	220	1,100
Carbazole	450	450
Dalapon	25	25
Dibenzo(a,h)anthracene	550	550
Dichlorodifluoromethane	1	3
Endrin	5.4	5.4
Endrin Aldehyde	7	7
Gamma-Chlordane	200	200
Heptachlor	1	1
Indeno(1,2,3-CD)pyrene	210	980
Methoxychlor	2.1	33
Methyl Acetate	1.9	3

Notes:

[1] Table 5 presents additional data collected from background sampling locations to be considered on a site-specific basis for soil. Additional data presented in Table 5 include more uncertainty and, thus, are for use on a case-by-case basis when a compound could otherwise be a driver for action, such as when Site data minimally exceed risk-based remedial goals (Use in any other scenario must be approved by U.S. EPA and SCDHEC). Use of additional data presented in Table 5 should be discussed during scoping of the risk document and requires coordination with and approval from the MCRD Parris Island Partnering Team.

Minimum and maximum values were compiled before outliers were removed.
See Appendix C8 for a summary of the background dataset associated with these compounds. All units are micrograms per kilogram (µg/kg)

DDD = Dichlorodiphenyldichloroethane

a = Identified as containing outlier data by ProUCL; see Appendix B1

Table 6
Additional Data Collected from Background Sediment Sampling Locations[1]
ProUCL Background Evaluation — Marine Corps Recruit Depot Parris Island, South Carolina

Compound	Minimum Reported Concentration	Maximum Reported Concentration
Methoxychlor[a]	22.4	362
Methyl Acetate[a]	3.3	3.3
Selenium[a]	1,120	1,670

Notes:

[1] Table 6 presents additional data collected from background sampling locations to be considered on a site-specific basis for sediment. Additional data presented in Table 6 include more uncertainty and, thus, are for use on a case-by-case basis when a compound could otherwise be a driver for action, such as when Site data minimally exceed risk-based remedial goals (Use in any other scenario must be approved by U.S. EPA and SCDHEC). Use of additional data presented in Table 6 should be discussed during scoping of the risk document and requires coordination with and approval from the MCRD Parris Island Partnering Team.

See Appendix C16 for a summary of the background dataset associated with these compounds.

All units are micrograms per kilogram (µg/kg)

REFERENCES

Tetra Tech NUS. *RCRA Facility Investigation Report for Solid Waste Management Unit 3, Borrow Pit Landfill, Appendix Z Basewide Background Report, Marine Corps Air Station Beaufort, South Carolina*. November 2006.

United States Environmental Protection Agency. (Website) [Statistical Software Download]. ProUCL Version 5.0.00. 2014a. Retrieved from: http://www.epa.gov/osp/hstl/tsc/software.htm#Download

— *Draft Final Region 4 Human Health Risk Assessment Supplemental Guidance.* Technical Services Section, Superfund Division, Region 4. January 2014b.

— *ProUCL Version 5.0.00 User Guide, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*. EPA/600/R-07/041. Office of Research and Development. September 2013a.

— *ProUCL Version 5.0.00 Technical Guide, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*. EPA/600/R-07/041. September 2013b.

— *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities — Unified Guidance*. EPA/530/R-09/007. Office of Resource Conservation and Recovery. March 2009.

— *Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs)*. Office of Solid Waste and Emergency Response Directive 9285.7-78. Office of Solid Waste and Emergency Response. June 2007.

— *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites.* EPA/540/R-01/003. Office of Emergency and Remedial Response September 2002.

— *Guidance for Data Quality Assessment: Practical Methods for Data Analysis: EPA QA/G-9, QA00 UPDATE.* Office of Environmental Information. EPA 600-R-96-084. July 2000.

U.S. Navy. Naval Facilities Engineering Command. *Guidance for Environmental Background Analysis, Volume 2: Sediment.* Naval Facilities Engineering Service Center User's Guide UG-2054-ENV. April 2003.

U.S. Navy. Naval Facilities Engineering Command. *Guidance for Environmental Background Analysis, Volume 1: Soil*. Naval Facilities Engineering Service Center User's Guide UG-2049-ENV. April 2002.

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Appendix A
Background Data

Appendix A1: **Soil Background Data**
Appendix A2: **Sediment Background Data**

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Appendix A1
Soil Background Data

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Appendix A1
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	2,4-D	D_2,4-D	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	ALPHA-CHLORDANE	D_ALPHA-CHLORDANE	ALUMINUM	D_ALUMINUM	ANTHRACENE	D_ANTHRACENE	ARSENIC	D_ARSENIC	BARIUM	D_BARIUM	BENZALDEHYDE	D_BENZALDEHYDE	BENZO(A)ANTHRACENE	D_BENZO(A)ANTHRACENE	BENZO(A)PYRENE
BEA-BG-SB-SSB-01-03	18	0	1.8	1	8.9	1	1.8	1	0.54	0	4520000	1	67	0	1700	1	15200	1			150	1	160
BEA-BG-SB-SSB-02-03	18	0	0.5	0	0.58	0	0.78	0	0.54	0	10200000	1	68	0	1400	1	7700	1			69	0	53
BEA-BG-SB-SSB-03-03	20	0	0.56	0	0.64	0	0.86	0	0.6	0	3940000	1	75	0	90	0	16100	1	210	0	76	0	58
BEA-BG-SB-SSB-04-03	19	0	0.53	0	0.61	0	0.82	0	0.57	0	3600000	1	71	0	1500	1	6600	1			72	0	56
BEA-BG-SB-SSB-05-03	18	0	0.5	0	0.58	0	0.77	0	0.54	0	4440000	1	67	0	80	0	16200	1			68	0	52
BEA-BG-SB-SSB-06-03	17	0	4.7	0	5.4	0	7.2	0	280	1	746000	1	62	0	390	1	2900	1			64	0	49
BEA-BG-SB-SSB-07-03	20	0	0.54	0	0.62	0	0.83	0	0.58	0	4990000	1	72	0	1600	1	9600	1			74	0	56
BEA-BG-SB-SSB-08-03	17	0	0.47	0	0.54	0	0.73	0	0.51	0	6280000	1	63	0	520	1	13000	1			64	0	49
BEA-BG-SB-SSB-09-03	17	0	0.47	0	0.54	0	0.72	0	0.51	0	4670000	1	63	0	890	1	6200	1			64	0	49
BEA-BG-SB-SSB-10-03	18	0	0.51	0	0.58	0	0.78	0	0.54	0	2430000	1	68	0	250	1	1800	1			69	0	53
BEA-BG-SS-SSB-01-01	18	0	0.48	0	2.4	1	5.2	1	0.52	0	3040000	1	77	1	60	0	13000	1			500	1	540
BEA-BG-SS-SSB-02-01	17	0	0.48	0	0.55	0	0.74	0	0.52	0	4480000	1	64	0	1200	1	11100	1			65	0	58
BEA-BG-SS-SSB-03-01	18	0	0.48	0	0.56	0	0.75	0	1.5	1	4300000	1	65	0	1100	1	14400	1			66	0	51
BEA-BG-SS-SSB-03-01-D	17	0	0.48	0	0.56	0	0.74	0	0.52	0	3750000	1	64	0	890	1	13100	1	180	0	66	0	50
BEA-BG-SS-SSB-04-01	22	0	0.6	0	0.69	0	0.92	0	0.65	0	4430000	1	80	0	110	0	12000	1	360	1	82	0	63
BEA-BG-SS-SSB-04-01-D	20	0	0.54	0	0.62	0	0.83	0	0.58	0	3510000	1	72	0	520	1	11600	1	800	1	74	0	56
BEA-BG-SS-SSB-05-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	2960000	1	64	0	100	0	15400	1			66	0	50
BEA-BG-SS-SSB-06-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	2140000	1	65	0	500	1	9200	1			66	0	50
BEA-BG-SS-SSB-07-01	19	0	0.52	0	0.6	0	0.8	0	0.56	0	4150000	1	70	0	710	1	12100	1			71	0	55
BEA-BG-SS-SSB-08-01	18	0	0.49	0	0.57	0	0.76	0	0.53	0	9080000	1	66	0	1300	1	21200	1			67	0	52
BEA-BG-SS-SSB-09-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	4820000	1	65	0	610	1	9900	1			66	0	51
BEA-BG-SS-SSB-10-01	18	0	0.49	0	0.56	0	0.75	0	0.52	0	3780000	1	65	0	500	1	7800	1			66	0	51
SCS-01_0-1	12	0	0.206	0	0.204	0	0.333	0	0.161	0	4120000	1	590	1	640	0	15600	1			2200	1	1400
SCS-01_2-3	12	0	0.213	0	0.211	0	0.344	0	4.65	1	12100000	1	42	0	3300	1	26900	1			30	0	42
SCS-02_0-1	12	0	0.206	0	0.204	0	0.333	0	2.23	1	3180000	1	41	0	628	0	7280	1			29	0	40
SCS-02_2-3	13	0	0.223	0	0.221	0	0.361	0	2.5	1	10900000	1	44	0	2400	1	17100	1			31	0	44
SCS-03_0-1	12	0	0.208	0	0.206	0	0.336	0	0.163	0	6450000	1	41	0	1180	1	30400	1			29	0	41
SCS-03_2-3	12	0	0.216	0	0.213	0	0.348	0	0.169	0	4000000	1	43	0	1000	1	32500	1			30	0	42
SCS-04_0-1	12	0	0.208	0	5.41	1	4.87	1	0.163	0	5270000	1	41	0	1550	1	16800	1			29	0	41
SCS-04_2-3	12	0	0.213	0	0.211	0	0.344	0	0.166	0	2190000	1	42	0	910	1	5500	1			30	0	42
SCS-05_0-1	11	0	0.199	0	0.197	0	0.322	0	11.9	1	1530000	1	39	0	615	0	11600	1			28	0	39
SCS-05_2-3	12	0	0.213	0	0.211	0	0.344	0	2.36	1	1160000	1	42	0	1220	1	13000	1			30	0	42
SCS-06_0-1	11	0	0.201	0	0.199	0	0.325	0	0.157	0	5910000	1	40	0	818	1	26900	1			28	0	40
SCS-06_2-3	12	0	0.204	0	0.201	0	0.329	0	2.3	1	904000	1	40	0	679	1	4300	1			28	0	40
SCS-07_0-1	12	0	0.21	0	0.208	0	0.34	0	0.165	0	4630000	1	42	0	656	0	22400	1			29	0	41
SCS-07_2-3	12	0	0.21	0	0.208	0	0.34	0	0.165	0	4030000	1	42	0	880	1	16800	1			29	0	41
SCS-08_0-1	12	0	0.211	0	0.208	0	0.34	0	0.165	0	2100000	1	42	0	1310	1	15200	1			29	0	41
SCS-08_2-3	12	0	0.218	0	0.216	0	0.352	0	0.17	0	2870000	1	43	0	659	0	5800	1			31	0	43
SCS-09_0-1	11	0	0.201	0	0.199	0	0.325	0	0.157	0	2290000	1	40	0	1810	1	9190	1			28	0	40
SCS-09_2-3	11	0	0.199	0	0.197	0	0.322	0	2.56	1	2730000	1	39	0	1000	1	4000	1			28	0	39
SCS-10_0-1	12	0	0.215	0	0.213	0	0.348	0	0.168	0	4090000	1	43	0	1110	1	4430	1			30	0	42
SCS-10_2-3	13	0	0.223	0	0.221	0	0.361	0	0.175	0	9360000	1	44	0	2300	1	10300	1			31	0	44
SSA-01_0-1	20	1	0.235	0	0.232	0	0.379	0	2.45	1	6270000	1	47	0	968	1	12600	1			33	0	46
SSA-01_0-1-D	12	0	0.201	0	0.199	0	0.326	0	0.157	0	4670000	1	40	0	882	1	10500	1			28	0	40
SSA-01_2-3	11	0	0.185	0	0.183	0	0.299	0	0.145	0	3920000	1	37	0	892	1	4630	1			26	0	36
SSA-02_0-1	12	0	0.213	0	0.211	0	4.03	1	3.86	1	127000	1	42	0	669	0	681	1			30	0	42
SSA-02_0-1-D	12	0	0.215	0	0.213	0	0.348	0	0.168	0	2360000	1	43	0	720	1	3310	1			30	0	42
SSA-02_2-3	13	0	0.232	0	0.229	0	0.375	0	0.181	0	3610000	1	46	0	1230	1	4260	1			32	0	45
SSA-03_0-1	11	0	0.201	0	12.1	1	0.325	0	0.157	0	4610000	1	40	0	855	1	8260	1			28	0	39
SSA-03_0-1-D	11	0	0.201	0	0.199	0	0.326	0	0.158	0	4440000	1	40	0	1000	1	7550	1			28	0	40
SSA-03_2-3	11	0	0.197	0	0.195	0	0.318	0	0.154	0	2220000	1	39	0	608	1	3710	1			28	0	39
SSA-04_0-1	11	0	0.201	0	0.199	0	0.325	0	0.862	1	2830000	1	40	0	594	0	5780	1			28	0	40
SSA-04_0-1-D	11	0	0.201	0	0.199	0	0.326	0	0.158	0	4960000	1	40	0	605	0	16100	1			28	0	39
SSA-04_2-3	12	0	0.204	0	0.201	0	0.329	0	1.49	1	3550000	1	40	0	721	1	5400	1			28	0	40
SSA-05_0-1	12	0	0.204	0	0.201	0	0.329	0	0.159	0	5180000	1	40	0	873	1	18600	1			28	0	40
SSA-05_2-3	11	0	0.197	0	0.195	0	0.319	0	9.21	1	4480000	1	39	0	1790	1	10700	1			28	0	39
SSA-06_0-1	12	0	0.211	0	0.208	0	2.93	1	1.97	1	5920000	1	42	0	1020	1	11500	1			29	0	41
SSA-06_2-3	12	0	0.21	0	0.208	0	0.34	0	3.75	1	4780000	1	42	0	604	0	11100	1			29	0	41
SSA-07_0-1	11	0	0.193	0	0.191	0	0.312	0	0.151	0	1420000	1	38	0	680	1	6440	1			27	0	38
SSA-07_2-3	11	0	0.195	0	0.193	0	0.315	0	4.33	1	958000	1	39	0	593	0	2940	1			27	0	38
SSA-08_0-1	12	0	0.203	0	0.201	0	0.329	0	0.159	0	4880000	1	40	0	1290	1	13400	1			28	0	40
SSA-08_2-3	12	0	0.208	0	0.206	0	0.336	0	4.44	1	5440000	1	41	0	995	1	12700	1			29	0	41
SSA-09_0-1	12	0	0.204	0	0.201	0	0.329	0	0.159	0	4720000	1	40	0	844	1	15400	1			28	0	40
SSA-09_2-3	12	0	0.204	0	0.201	0	0.329	0	5.71	1	2100000	1	40	0	624	0	5040	1			28	0	40
SSA-10_0-1	11	0	0.199	0	0.197	0	0.322	0	0.156	0	4610000	1	39	0	606	0	3700	1			28	0	39
SSA-10_2-3	11	0	0.199	0	0.197	0	0.322	0	3.14	1	2860000	1	39	0	666	1	3680	1			28	0	39

Notes:
Concentrations reported with at "0" in their corresponding "D_Parameter" column are non-detects.
Concentrations reported with a "1" in their corresponding "D_Parameter" Column are positive detects.
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL

Appendix A1
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	D_BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	D_BENZO(B)FLUORANTHENE	BENZO(G,H,I)PERYLENE	D_BENZO(G,H,I)PERYLENE	BENZO(K)FLUORANTHENE	D_BENZO(K)FLUORANTHENE	BERYLLIUM	D_BERYLLIUM	CADMIUM	D_CADMIUM	CALCIUM	D_CALCIUM	CARBAZOLE	D_CARBAZOLE	CARBON DISULFIDE	D_CARBON DISULFIDE
BEA-BG-SB-SSB-01-03	1	190	1	150	0	170	1	180	1	10	0	1390000	1	69	0	2	0
BEA-BG-SB-SSB-02-03	0	74	0	150	0	68	0	90	1	10	0	1080000	1	70	0	2	0
BEA-BG-SB-SSB-03-03	0	82	0	170	0	76	0	120	1	10	0	446000	1	77	0	2	0
BEA-BG-SB-SSB-04-03	0	79	0	160	0	72	0	10	0	10	0	267000	1	74	0	2	0
BEA-BG-SB-SSB-05-03	0	74	0	150	0	68	0	110	1	10	0	467000	1	70	0	2	0
BEA-BG-SB-SSB-06-03	0	69	0	140	0	63	0	60	1	10	0	734000	1	65	0	2	0
BEA-BG-SB-SSB-07-03	0	80	0	160	0	73	0	270	1	10	0	5260000	1	75	0	2	0
BEA-BG-SB-SSB-08-03	0	70	0	140	0	64	0	10	0	10	0	232000	1	65	0	2	0
BEA-BG-SB-SSB-09-03	0	70	0	140	0	64	0	10	0	10	0	1240	0	65	0	2	0
BEA-BG-SB-SSB-10-03	0	75	0	150	0	68	0	10	0	10	0	970	0	70	0	2	0
BEA-BG-SS-SSB-01-01	1	540	1	220	1	520	1	10	0	240	1	1070000	1	67	0	2	0
BEA-BG-SS-SSB-02-01	1	89	1	140	0	66	1	150	1	320	1	43300000	1	66	0	2	0
BEA-BG-SS-SSB-03-01	0	72	0	140	0	66	0	100	1	110	1	9810000	1	67	0	2	0
BEA-BG-SS-SSB-03-01-D	0	71	0	140	0	65	0	90	1	10	0	1290000	1	67	0	2	0
BEA-BG-SS-SSB-04-01	0	89	0	180	0	81	0	10	0	10	0	623000	1	83	0	2	0
BEA-BG-SS-SSB-04-01-D	0	80	0	160	0	73	0	80	1	10	0	521000	1	75	0	2	0
BEA-BG-SS-SSB-05-01	0	71	0	140	0	65	0	80	1	10	0	202000	1	67	0	2	0
BEA-BG-SS-SSB-06-01	0	71	0	140	0	65	0	100	1	10	0	756000	1	67	0	2	0
BEA-BG-SS-SSB-07-01	0	77	0	160	0	71	0	180	1	10	0	21000000	1	72	0	2	0
BEA-BG-SS-SSB-08-01	0	73	0	150	0	67	0	120	1	10	0	487000	1	68	0	2	0
BEA-BG-SS-SSB-09-01	0	71	0	140	0	66	0	80	1	10	0	75300	1	67	0	2	0
BEA-BG-SS-SSB-10-01	0	72	0	140	0	66	0	70	1	10	0	39900	1	68	0	2	0
SCS-01_0-1	1	1900	1	1100	1	1500	1	110	1	66.2	0	486000	1	450	1	2.1	0
SCS-01_2-3	0	39	0	32	0	48	0	190	1	68.2	0	1000000	1	53	0	72	1
SCS-02_0-1	0	37	0	31	0	47	0	86.7	0	65	0	72400	1	51	0	2.2	1
SCS-02_2-3	0	41	0	34	0	51	0	160	1	71.6	0	14700	0	56	0	100	1
SCS-03_0-1	0	38	0	31	0	47	0	288	1	63.9	0	186000	1	52	0	2.1	0
SCS-03_2-3	0	39	0	33	0	49	0	160	1	67.2	0	13800	0	54	0	54	1
SCS-04_0-1	0	38	0	31	0	47	0	86.6	0	64.9	0	387000	1	52	0	2	0
SCS-04_2-3	0	39	0	32	0	48	0	90.3	0	67.7	0	13900	0	53	0	230	1
SCS-05_0-1	0	36	0	30	0	45	0	106	1	63.6	0	13000	0	50	0	5.2	1
SCS-05_2-3	0	39	0	32	0	48	0	159	1	68.3	0	14000	0	53	0	80	1
SCS-06_0-1	0	37	0	30	0	46	0	265	1	63.7	0	376000	1	50	0	11	1
SCS-06_2-3	0	37	0	31	0	46	0	83.6	1	62.7	0	12900	0	51	0	100	1
SCS-07_0-1	0	38	0	32	0	48	0	113	1	67.9	0	487000	1	52	0	2.9	0
SCS-07_2-3	0	38	0	32	0	48	0	150	1	67.9	0	406000	1	52	0	3.1	1
SCS-08_0-1	0	38	0	32	0	48	0	90.2	0	67.6	0	525000	1	52	0	2.9	0
SCS-08_2-3	0	40	0	33	0	50	0	90.9	0	68.2	0	346000	1	54	0	76	1
SCS-09_0-1	0	37	0	30	0	46	0	87	0	65.3	0	276000	1	50	0	3.2	0
SCS-09_2-3	0	36	0	30	0	45	0	86.1	0	64.6	0	13200	0	50	0	2.8	0
SCS-10_0-1	0	39	0	33	0	49	0	90.7	0	68	0	131000	1	54	0	8	1
SCS-10_2-3	0	41	0	34	0	51	0	120	1	67.1	0	13800	0	56	0	89	1
SSA-01_0-1	0	43	0	35	0	53	0	135	1	73.5	0	15100	0	58	0	6	1
SSA-01_0-1-D	0	37	0	30	0	46	0	113	1	61.6	0	12600	0	50	0	5.8	1
SSA-01_2-3	0	34	0	28	0	42	0	73.6	0	55.2	0	11300	0	46	0	2.2	0
SSA-02_0-1	0	39	0	32	0	48	0	92.3	0	69.2	0	14200	0	53	0	8.5	1
SSA-02_0-1-D	0	39	0	33	0	49	0	155	1	66.5	1	13600	0	54	0	11	1
SSA-02_2-3	0	42	0	35	0	53	0	179	1	71.7	1	14700	0	58	0	63	1
SSA-03_0-1	0	37	0	30	0	46	0	103	1	61.8	0	12700	0	50	0	2	0
SSA-03_0-1-D	0	37	0	30	0	46	0	82.6	1	62	0	12700	0	50	0	2.5	0
SSA-03_2-3	0	36	0	30	0	45	0	78.5	0	58.9	0	12100	0	49	0	2.8	1
SSA-04_0-1	0	37	0	30	0	46	0	81.9	0	61.4	0	12600	0	50	0	12	1
SSA-04_0-1-D	0	37	0	30	0	46	0	104	1	62.6	0	12800	0	50	0	2.7	0
SSA-04_2-3	0	37	0	31	0	46	0	84.8	1	63.6	0	13000	0	51	0	3.8	1
SSA-05_0-1	0	37	0	31	0	46	0	131	1	65.5	0	389000	1	51	0	2.2	0
SSA-05_2-3	0	36	0	30	0	45	0	100	1	60.1	0	12300	0	49	0	8.3	1
SSA-06_0-1	0	38	0	32	0	48	0	94.1	1	62.8	0	379000	1	52	0	2	1
SSA-06_2-3	0	38	0	32	0	48	0	83.4	0	62.5	0	216000	1	52	0	3.9	1
SSA-07_0-1	0	35	0	29	0	44	0	80	0	60	0	12300	0	48	0	3.7	1
SSA-07_2-3	0	35	0	29	0	44	0	81.8	0	61.4	0	12600	0	49	0	19	1
SSA-08_0-1	0	37	0	31	0	46	0	102	1	61	0	495000	1	51	0	2.1	0
SSA-08_2-3	0	38	0	31	0	47	0	93.3	1	62.2	0	252000	1	52	0	2	0
SSA-09_0-1	0	37	0	31	0	46	0	141	1	64.9	0	757000	1	51	0	2.9	0
SSA-09_2-3	0	37	0	31	0	46	0	86.1	0	64.6	0	13200	0	51	0	49	1
SSA-10_0-1	0	36	0	30	0	45	0	83.6	0	62.7	0	239000	1	50	0	2.8	0
SSA-10_2-3	0	36	0	30	0	45	0	79.6	0	59.7	0	12200	0	50	0	74	1

Appendix A1
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	CHROMIUM	D_CHROMIUM	CHRYSENE	D_CHRYSENE	COBALT	D_COBALT	COPPER	D_COPPER	DALAPON	D_DALAPON	DIBENZO(A,H)ANTHRACENE	D_DIBENZO(A,H)ANTHRACENE	DICHLORODIFLUOROMETHANE	D_DICHLORODIFLUOROMETHANE	ENDOSULFAN SULFATE	D_ENDOSULFAN SULFATE	ENDRIN	D_ENDRIN	ENDRIN ALDEHYDE	D_ENDRIN ALDEHYDE
BEA-BG-SB-SSB-01-03	7200	1	180	1	330	1	1800	1	20	0	160	0	2	0	0.73	0	1	0	1.3	0
BEA-BG-SB-SSB-02-03	6400	1	76	0	590	1	890	1	20	0	160	0	2	0	0.74	0	1	0	1.4	0
BEA-BG-SB-SSB-03-03	4800	1	85	0	340	1	1300	1	22	0	180	0	2	0	0.82	0	1.2	0	1.5	0
BEA-BG-SB-SSB-04-03	4400	1	81	0	190	1	720	1	21	0	170	0	2	0	0.78	0	1.1	0	1.4	0
BEA-BG-SB-SSB-05-03	6600	1	76	0	280	1	1200	1	20	0	160	0	2	0	0.73	0	1	0	1.4	0
BEA-BG-SB-SSB-06-03	2600	1	71	0	200	1	570	1	18	0	150	0	2	0	6.8	0	9.7	0	12	0
BEA-BG-SB-SSB-07-03	10100	1	82	0	1000	1	1500	1	21	0	180	0	2	0	0.79	0	1.1	0	1.4	0
BEA-BG-SB-SSB-08-03	7400	1	72	0	570	1	830	1	18	0	150	0	2	0	0.69	0	0.98	0	1.3	0
BEA-BG-SB-SSB-09-03	5900	1	71	0	240	1	740	1	18	0	150	0	2	0	0.69	0	0.98	0	1.3	0
BEA-BG-SB-SSB-10-03	2700	1	77	0	10	0	320	1	20	0	160	0	2	0	0.74	0	1	0	1.4	0
BEA-BG-SS-SSB-01-01	4500	1	560	1	220	1	3700	1	19	0	160	0	2	0	0.71	0	1	0	1.3	0
BEA-BG-SS-SSB-02-01	7200	1	72	0	1200	1	3800	1	19	0	160	0	2	0	0.7	0	0.99	0	1.3	0
BEA-BG-SS-SSB-03-01	5400	1	74	0	450	1	1900	1	19	0	160	0	2	0	0.71	0	1	0	1.3	0
BEA-BG-SS-SSB-03-01-D	5500	1	73	0	400	1	2000	1	19	0	160	0	2	0	0.7	0	1	0	1.3	0
BEA-BG-SS-SSB-04-01	4800	1	91	0	280	1	2100	1	24	0	200	0	3	0	0.88	0	1.2	0	1.6	0
BEA-BG-SS-SSB-04-01-D	3900	1	82	0	270	1	2200	1	21	0	180	0	2	0	0.79	0	1.1	0	1.4	0
BEA-BG-SS-SSB-05-01	4100	1	73	0	240	1	2300	1	19	0	160	0	2	0	0.7	0	1	0	1.3	0
BEA-BG-SS-SSB-06-01	3900	1	73	0	260	1	2400	1	25	1	160	0	2	0	0.7	0	1	0	1.3	0
BEA-BG-SS-SSB-07-01	7400	1	79	0	620	1	1800	1	20	0	170	0	2	0	0.76	0	1.1	0	1.4	0
BEA-BG-SS-SSB-08-01	7500	1	75	0	810	1	1500	1	19	0	160	0	2	0	0.72	0	1	0	1.3	0
BEA-BG-SS-SSB-09-01	4800	1	73	0	270	1	790	1	19	0	160	0	2	0	0.71	0	1	0	1.3	0
BEA-BG-SS-SSB-10-01	3400	1	74	0	220	1	850	1	19	0	160	0	2	0	0.71	0	1	0	1.3	0
SCS-01_0-1	2310	1	2500	1	155	1	1450	1	4.5	0	550	1	1	1	0.249	0	0.189	0	0.261	0
SCS-01_2-3	11800	1	41	0	1000	1	2900	1	4.6	0	29	0	0.83	0	0.257	0	0.195	0	0.269	0
SCS-02_0-1	2580	1	40	0	314	1	1340	1	4.5	0	28	0	0.62	0	0.249	0	0.189	0	0.261	0
SCS-02_2-3	14300	1	43	0	540	1	2200	1	4.9	0	31	0	1.1	0	0.27	0	0.205	0	0.283	0
SCS-03_0-1	3700	1	40	0	490	1	3440	1	4.5	0	29	0	0.72	0	0.251	0	0.191	0	0.263	0
SCS-03_2-3	3200	1	42	0	850	1	2300	1	4.7	0	30	0	0.73	0	0.26	0	0.197	0	0.273	0
SCS-04_0-1	6290	1	40	0	314	1	4510	1	4.5	0	29	0	0.68	0	2.42	1	0.191	0	0.263	0
SCS-04_2-3	2400	1	41	0	410	1	1900	1	4.6	0	29	0	0.98	0	0.257	0	0.195	0	0.269	0
SCS-05_0-1	1740	1	38	0	276	1	2140	1	4.3	0	27	0	0.76	0	0.241	0	0.182	0	0.252	0
SCS-05_2-3	2630	1	41	0	182	1	1890	1	4.6	0	29	0	0.98	0	0.257	0	0.195	0	0.27	0
SCS-06_0-1	3670	1	39	0	403	1	2850	1	4.4	0	28	0	0.94	0	4.47	1	0.184	0	0.255	0
SCS-06_2-3	1990	1	39	0	251	1	3630	1	4.4	0	28	0	0.86	0	0.246	0	0.186	0	0.258	0
SCS-07_0-1	3330	1	41	0	419	1	3030	1	4.6	0	29	0	0.97	0	0.254	0	0.193	0	0.266	0
SCS-07_2-3	3200	1	41	0	500	1	2700	1	4.6	0	29	0	1	0	0.254	0	0.193	0	0.266	0
SCS-08_0-1	3380	1	41	0	135	0	3810	1	4.6	0	29	0	0.97	0	0.254	0	0.193	0	0.266	0
SCS-08_2-3	3300	1	42	0	180	1	1700	1	4.8	0	30	0	0.86	0	0.263	0	0.2	0	0.276	0
SCS-09_0-1	8030	1	39	0	131	0	4850	1	4.4	0	28	0	1.1	0	0.243	0	0.184	0	0.255	0
SCS-09_2-3	2900	1	38	0	180	1	1600	1	4.3	0	27	0	0.96	0	0.24	0	0.182	0	0.252	0
SCS-10_0-1	3630	1	42	0	136	0	1330	1	4.7	0	30	0	0.94	0	0.26	0	0.197	0	0.273	0
SCS-10_2-3	13800	1	43	0	450	1	2300	1	4.9	0	31	0	0.83	0	0.27	0	0.205	0	0.283	0
SSA-01_0-1	4490	1	45	0	306	1	2770	1	5.1	0	32	0	0.94	0	0.284	0	0.215	0	0.297	0
SSA-01_0-1-D	4580	1	39	0	277	1	2050	1	4.4	0	28	0	0.91	0	0.243	0	0.184	0	0.255	0
SSA-01_2-3	4460	1	36	0	212	1	3470	1	4	0	26	0	0.74	0	0.224	0	0.17	0	0.234	0
SSA-02_0-1	484	1	41	0	138	0	2680	1	4.6	0	29	0	0.75	0	0.257	0	0.195	0	0.269	0
SSA-02_0-1-D	2580	1	42	0	133	0	2590	1	4.7	0	30	0	0.81	0	0.26	0	0.197	0	0.273	0
SSA-02_2-3	3500	1	45	0	239	1	3500	1	5	0	32	0	0.74	0	0.28	0	0.212	0	0.293	0
SSA-03_0-1	3920	1	39	0	196	1	3210	1	4.4	0	28	0	0.67	0	13.6	1	5.45	1	6.53	1
SSA-03_0-1-D	4750	1	39	0	196	1	2640	1	4.4	0	28	0	0.85	0	0.243	0	0.185	0	0.255	0
SSA-03_2-3	3730	1	38	0	157	1	3950	1	4.3	0	27	0	0.74	0	0.238	0	0.18	0	0.249	0
SSA-04_0-1	2800	1	39	0	133	1	2840	1	4.4	0	28	0	2.8	1	0.243	0	0.184	0	0.255	0
SSA-04_0-1-D	2720	1	39	0	125	0	2460	1	4.4	0	28	0	0.93	0	0.243	0	0.185	0	0.255	0
SSA-04_2-3	4710	1	39	0	276	1	3230	1	4.4	0	28	0	0.69	0	0.246	0	0.187	0	0.258	0
SSA-05_0-1	3020	1	39	0	131	1	3250	1	4.4	0	28	0	0.75	0	0.246	0	0.187	0	0.258	0
SSA-05_2-3	5360	1	38	0	410	1	3000	1	4.3	0	27	0	0.78	0	0.238	0	0.181	0	0.249	0
SSA-06_0-1	4450	1	41	0	356	1	2560	1	4.6	0	29	0	0.67	0	0.254	0	0.193	0	0.266	0
SSA-06_2-3	3620	1	41	0	261	1	1790	1	4.6	0	29	0	0.67	0	0.254	0	0.193	0	0.266	0
SSA-07_0-1	2110	1	37	0	150	1	2200	1	4.2	0	27	0	0.77	0	0.233	0	0.177	0	0.244	0
SSA-07_2-3	1880	1	38	0	123	0	2320	1	4.3	0	27	0	0.8	0	0.236	0	0.179	0	0.247	0
SSA-08_0-1	3490	1	39	0	335	1	2280	1	4.4	0	28	0	0.71	0	0.246	0	0.186	0	0.257	0
SSA-08_2-3	3620	1	40	0	363	1	1980	1	4.5	0	29	0	0.68	0	0.251	0	0.191	0	0.263	0
SSA-09_0-1	2720	1	39	0	260	1	2870	1	4.4	0	28	0	0.98	0	0.246	0	0.186	0	0.258	0
SSA-09_2-3	2110	1	39	0	129	1	2890	1	4.4	0	28	0	0.93	0	0.246	0	0.186	0	0.258	0
SSA-10_0-1	2570	1	38	0	125	0	2230	1	4.3	0	27	0	0.95	0	0.24	0	0.182	0	0.252	0
SSA-10_2-3	3970	1	38	0	129	1	1890	1	4.3	0	27	0	0.92	0	0.24	0	0.182	0	0.252	0

Appendix A1
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	FLUORANTHENE	D_FLUORANTHENE	GAMMA-CHLORDANE	D_GAMMA-CHLORDANE	HEPTACHLOR	D_HEPTACHLOR	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE	IRON	D_IRON	LEAD	D_LEAD	MAGNESIUM	D_MAGNESIUM	MANGANESE	D_MANGANESE	MERCURY	D_MERCURY	METHOXYCHLOR	D_METHOXYCHLOR	METHYL ACETATE	D_METHYL ACETATE	NICKEL	D_NICKEL
BEA-BG-SB-SSB-01-03	260	1	0.54	0	2	0	150	0	4280000	1	15500	1	348000	1	15100	1	40	1	1.4	0	1	0	1600	1
BEA-BG-SB-SSB-02-03	83	0	0.54	0	2	0	150	0	1600000	1	6200	1	159000	1	7600	1	70	1	1.4	0	1	0	2400	1
BEA-BG-SB-SSB-03-03	91	0	0.6	0	2.2	0	170	0	2430000	1	4400	1	171000	1	25900	1	10	0	1.5	0	1	0	1400	1
BEA-BG-SB-SSB-04-03	87	0	0.57	0	2.1	0	160	0	1170000	1	3500	1	101000	1	8700	1	10	0	1.5	0	1	0	1100	1
BEA-BG-SB-SSB-05-03	82	0	0.54	0	2	0	150	0	2220000	1	4600	1	177000	1	15700	1	10	0	1.4	0	1	0	1600	1
BEA-BG-SB-SSB-06-03	76	0	200	1	18	0	140	0	857000	1	1200	1	100000	1	10500	1	10	0	13	0	1	0	480	1
BEA-BG-SB-SSB-07-03	88	0	0.58	0	2.1	0	160	0	5020000	1	3300	1	1040000	1	44100	1	10	0	1.5	0	1	0	2600	1
BEA-BG-SB-SSB-08-03	77	0	0.51	0	1.8	0	140	0	3020000	1	4200	1	159000	1	5900	1	10	0	1.3	0	1	0	3300	1
BEA-BG-SB-SSB-09-03	77	0	0.51	0	1.8	0	140	0	3680000	1	3200	1	181000	1	9400	1	10	0	1.3	0	1	0	1200	1
BEA-BG-SB-SSB-10-03	83	0	0.54	0	2	0	160	0	724000	1	2100	1	40700	1	5700	1	10	0	1.4	0	1	0	360	1
BEA-BG-SS-SSB-01-01	920	1	0.52	0	1.9	0	210	1	1770000	1	20400	1	140000	1	14900	1	10	0	1.3	0	1	0	950	1
BEA-BG-SS-SSB-02-01	84	1	0.52	0	1.9	0	150	0	3750000	1	16200	1	1000000	1	75800	1	10	0	1.3	0	0.9	0	3600	1
BEA-BG-SS-SSB-03-01	80	0	0.52	0	1.9	0	150	0	3390000	1	9600	1	304000	1	19000	1	40	1	1.3	0	0.9	0	1200	1
BEA-BG-SS-SSB-03-01-D	79	0	0.52	0	1.9	0	150	0	3310000	1	7000	1	198000	1	14600	1	10	0	1.3	0	0.9	0	1200	1
BEA-BG-SS-SSB-04-01	98	0	0.65	0	2.4	0	180	0	2110000	1	8300	1	218000	1	12800	1	10	0	1.7	0	1	0	1300	1
BEA-BG-SS-SSB-04-01-D	89	0	0.58	0	2.1	0	170	0	1960000	1	9100	1	204000	1	13800	1	10	0	1.5	0	1	0	1200	1
BEA-BG-SS-SSB-05-01	79	0	0.52	0	1.9	0	150	0	1510000	1	3700	1	138000	1	35700	1	40	1	1.3	0	1	0	980	1
BEA-BG-SS-SSB-06-01	79	0	0.52	0	1.9	0	150	0	1490000	1	3000	1	141000	1	34000	1	10	0	1.3	0	1	0	740	1
BEA-BG-SS-SSB-07-01	86	0	0.56	0	2	0	160	0	3270000	1	3900	1	567000	1	22400	1	10	0	1.4	0	1	0	1700	1
BEA-BG-SS-SSB-08-01	81	0	0.53	0	1.9	0	150	0	5820000	1	6400	1	357000	1	21200	1	40	1	1.4	0	1	0	3200	1
BEA-BG-SS-SSB-09-01	79	0	0.52	0	1.9	0	150	0	2480000	1	4800	1	168000	1	10500	1	10	0	1.3	0	1	0	1500	1
BEA-BG-SS-SSB-10-01	80	0	0.52	0	1.9	0	150	0	1890000	1	3600	1	136000	1	8200	1	10	0	1.4	0	1	0	1100	1
SCS-01_0-1	5800	1	0.316	0	1.87	0	980	1	1700000	1	3220	1	108000	1	13000	1	150	1	32.8	1	3	1	1110	1
SCS-01_2-3	51	0	0.326	0	1.93	0	39	0	11200000	1	6300	1	298000	1	7500	1	310	1	1.31	0	0.87	0	2900	1
SCS-02_0-1	49	0	0.316	0	1.87	0	37	0	916000	1	3650	1	61400	1	4470	1	190	1	1.27	0	0.65	0	1070	1
SCS-02_2-3	54	0	0.342	0	2.03	0	41	0	7990000	1	8600	1	308000	1	4800	1	99	1	1.38	0	1.1	0	800	1
SCS-03_0-1	50	0	0.319	0	1.89	0	38	0	1670000	1	7520	1	131000	1	80100	1	230	1	1.28	0	0.75	0	1700	1
SCS-03_2-3	52	0	0.33	0	1.96	0	39	0	1750000	1	3700	1	145000	1	21700	1	69	1	1.33	0	0.77	0	990	1
SCS-04_0-1	50	0	0.319	0	1.89	0	38	0	4340000	1	12700	1	195000	1	11800	1	240	1	1.28	0	0.72	0	1030	1
SCS-04_2-3	51	0	0.326	0	1.93	0	39	0	574000	1	3200	1	48100	1	3800	1	120	1	1.31	0	1	0	650	1
SCS-05_0-1	48	0	0.305	0	1.81	0	36	0	978000	1	1280	1	77700	1	15100	1	120	1	1.23	0	0.79	0	520	1
SCS-05_2-3	51	0	0.327	0	1.94	0	39	0	2900000	1	978	1	69100	1	7240	1	9.4	0	1.31	0	1	0	341	0
SCS-06_0-1	48	0	0.308	0	1.83	0	37	0	2150000	1	4290	1	176000	1	18900	1	190	1	1.24	0	0.99	0	1780	1
SCS-06_2-3	49	0	0.312	0	1.85	0	37	0	773000	1	1580	1	48900	1	14600	1	59	1	1.25	0	0.9	0	314	1
SCS-07_0-1	51	0	0.323	0	1.91	0	38	0	2090000	1	6610	1	189000	1	40600	1	540	1	1.3	0	1	0	1660	1
SCS-07_2-3	51	0	0.323	0	1.91	0	38	0	1990000	1	5500	1	174000	1	24500	1	260	1	1.3	0	1.1	0	1400	1
SCS-08_0-1	50	0	0.323	0	1.91	0	38	0	1190000	1	4530	1	86200	1	72500	1	330	1	1.3	0	1	0	631	1
SCS-08_2-3	52	0	0.334	0	1.98	0	40	0	467000	1	3500	1	77200	1	2800	1	150	1	1.34	0	0.9	0	420	1
SCS-09_0-1	48	0	0.308	0	1.83	0	37	0	1130000	1	6630	1	49100	1	18200	1	770	1	1.24	0	1.1	0	424	1
SCS-09_2-3	48	0	0.305	0	1.81	0	36	0	1380000	1	2400	1	70600	1	3000	1	140	1	1.23	0	1	0	520	1
SCS-10_0-1	52	0	0.33	0	1.96	0	39	0	1420000	1	3050	1	63200	1	3840	1	300	1	1.33	0	0.99	0	1250	1
SCS-10_2-3	54	0	0.342	0	2.03	0	41	0	8000000	1	5100	1	320000	1	5700	1	180	1	1.38	0	0.86	0	880	1
SSA-01_0-1	56	0	0.36	0	2.13	0	43	0	2900000	1	4070	1	164000	1	12800	1	390	1	1.45	0	0.98	0	2110	1
SSA-01_0-1-D	48	0	0.309	0	1.83	0	37	0	3940000	1	2940	1	143000	1	8920	1	8.9	0	1.24	0	0.95	0	1360	1
SSA-01_2-3	44	0	0.284	0	1.68	0	34	0	1010000	1	3500	1	74500	1	4290	1	8.2	0	1.14	0	0.78	0	1220	1
SSA-02_0-1	51	0	0.326	0	1.03	1	39	0	98300	1	1250	1	6460	1	1900	1	9.1	0	2.11	1	0.78	0	346	0
SSA-02_0-1-D	52	0	0.33	0	1.96	0	39	0	152000	1	4260	1	57800	1	2120	1	9.5	0	1.33	0	0.84	0	332	0
SSA-02_2-3	56	0	0.355	0	2.11	0	42	0	288000	1	4470	1	89400	1	3580	1	94	1	1.43	0	0.77	0	573	1
SSA-03_0-1	48	0	0.308	0	1.83	0	37	0	2970000	1	4290	1	112000	1	14400	1	220	1	1.24	0	0.7	0	1050	1
SSA-03_0-1-D	48	0	0.309	0	1.83	0	37	0	3200000	1	4120	1	129000	1	10800	1	140	1	1.24	0	0.89	0	1200	1
SSA-03_2-3	47	0	0.302	0	1.79	0	36	0	409000	1	4220	1	60500	1	7120	1	8.7	0	1.21	0	0.77	0	618	1
SSA-04_0-1	48	0	0.308	0	1.83	0	37	0	1280000	1	3350	1	101000	1	6130	1	140	1	1.24	0	0.78	0	686	1
SSA-04_0-1-D	48	0	0.309	0	1.83	0	37	0	2190000	1	4120	1	115000	1	24200	1	350	1	1.24	0	0.97	0	1120	1
SSA-04_2-3	49	0	0.312	0	1.85	0	37	0	1320000	1	7050	1	66600	1	3130	1	8.9	0	1.25	0	0.72	0	742	1
SSA-05_0-1	49	0	0.312	0	1.85	0	37	0	2450000	1	3450	1	126000	1	23100	1	230	1	1.25	0	0.79	0	1640	1
SSA-05_2-3	47	0	0.302	0	1.79	0	36	0	3570000	1	2890	1	191000	1	6180	1	8.8	0	1.21	0	0.81	0	1880	1
SSA-06_0-1	50	0	0.323	0	1.91	0	38	0	2290000	1	5460	1	141000	1	5790	1	160	1	1.3	0	0.7	0	1130	1
SSA-06_2-3	51	0	0.323	0	1.91	0	38	0	1530000	1	4430	1	140000	1	5390	1	220	1	1.3	0	0.7	0	1010	1
SSA-07_0-1	46	0	0.296	0	1.75	0	35	0	1060000	1	2330	1	85500	1	5490	1	8.3	0	1.19	0	0.81	0	500	1
SSA-07_2-3	47	0	0.299	0	1.77	0	35	0	335000	1	1760	1	39900	1	3700	1	8.6	0	1.2	0	0.84	0	368	1
SSA-08_0-1	49	0	0.312	0	1.85	0	37	0	2610000	1	4270	1	143000	1	13400	1	370	1	1.25	0	0.74	0	1250	1
SSA-08_2-3	50	0	0.319	0	1.89	0	38	0	3020000	1	3640	1	179000	1	9980	1	250	1	1.28	0	0.72	0	1480	1
SSA-09_0-1	49	0	0.312	0	1.85	0	37	0	2060000	1	4380	1	154000	1	29300	1	270	1	1.25	0	1.9	1	1060	1
SSA-09_2-3	49	0	0.312	0	1.85	0	37	0	1680000	1	2480	1	78900	1	6890	1	74	1	1.25	0	0.98	0	323	0
SSA-10_0-1	48	0	0.305	0	1.81	0	36	0	3500000	1	2190	1	64700	1	4490	1	380	1	1.23	0	1	0	543	1
SSA-10_2-3	48	0	0.305	0	1.81	0	36	0	3500000	1	1120	1	114000	1	2540	1	8.7	0	1.23	0	0.97	0	587	1

Appendix A1
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	PERCENT SOLIDS	D_PERCENT SOLIDS	PHENANTHRENE	D_PHENANTHRENE	POTASSIUM	D_POTASSIUM	PYRENE	D_PYRENE	SELENIUM	D_SELENIUM	SILVER	D_SILVER	SODIUM	D_SODIUM	THALLIUM	D_THALLIUM	TOTAL DDD/DDE/DDT	D_TOTAL DDD/DDE/DDT	TOTAL_PAH*	D_TOTAL_PAH*
BEA-BG-SB-SSB-01-03	86	1	92	1	92400	1	280	1	340	1	10	0	549000	1	30	0	12.5	1	1122	1
BEA-BG-SB-SSB-02-03	86	1	67	0	108000	1	84	0	380	1	10	0	1490	0	20	0	0.78	0	380	0
BEA-BG-SB-SSB-03-03	78	1	74	0	86100	1	93	0	110	0	10	0	2030	0	20	0	0.86	0	420	0
BEA-BG-SB-SSB-04-03	81	1	71	0	2100	0	88	0	110	0	10	0	2030	0	20	0	0.82	0	400	0
BEA-BG-SB-SSB-05-03	86	1	67	0	125000	1	83	0	100	0	10	0	1740	0	20	0	0.77	0	380	0
BEA-BG-SB-SSB-06-03	93	1	62	0	62100	1	78	0	190	1	10	0	1610	0	20	0	7.2	0	360	0
BEA-BG-SB-SSB-07-03	80	1	72	0	570000	1	90	0	290	1	10	0	81200	1	20	0	0.83	0	410	0
BEA-BG-SB-SSB-08-03	92	1	63	0	96400	1	78	0	110	0	10	0	102000	1	20	0	0.73	0	360	0
BEA-BG-SB-SSB-09-03	92	1	63	0	83900	1	78	0	220	1	10	0	1930	0	20	0	0.72	0	360	0
BEA-BG-SB-SSB-10-03	86	1	67	0	1580	0	84	0	440	1	140	1	1520	0	20	0	0.78	0	380	0
BEA-BG-SS-SSB-01-01	89	1	390	1	77300	1	1100	1	230	1	10	0	1390	0	20	0	7.6	1	4087	1
BEA-BG-SS-SSB-02-01	90	1	64	0	390000	1	80	0	110	0	10	0	1980	0	20	0	0.74	0	142	1
BEA-BG-SS-SSB-03-01	89	1	65	0	104000	1	81	0	230	1	10	0	121000	1	20	0	0.75	0	370	0
BEA-BG-SS-SSB-03-01-D	90	1	64	0	84700	1	80	0	360	1	10	0	2110	0	20	0	0.74	0	370	0
BEA-BG-SS-SSB-04-01	72	1	80	0	99200	1	100	0	130	0	10	0	2400	0	30	0	0.92	0	460	0
BEA-BG-SS-SSB-04-01-D	80	1	72	0	101000	1	90	0	350	1	10	0	1970	0	20	0	0.83	0	410	0
BEA-BG-SS-SSB-05-01	90	1	64	0	93000	1	80	0	120	0	10	0	2170	0	30	0	0.74	0	370	0
BEA-BG-SS-SSB-06-01	90	1	64	0	99200	1	80	0	150	1	10	0	2040	0	20	0	0.74	0	370	0
BEA-BG-SS-SSB-07-01	83	1	70	0	282000	1	87	0	400	1	10	0	218000	1	20	0	0.8	0	400	0
BEA-BG-SS-SSB-08-01	88	1	66	0	199000	1	82	0	370	1	10	0	1680	0	20	0	0.76	0	380	0
BEA-BG-SS-SSB-09-01	90	1	64	0	110000	1	80	0	210	1	10	0	1470	0	20	0	0.74	0	370	0
BEA-BG-SS-SSB-10-01	89	1	65	0	74400	1	81	0	150	1	10	0	1620	0	20	0	0.75	0	370	0
SCS-01_0-1	89	1	3200	1	45200	1	3500	1	640	0	110	0	40200	0	386	1	0.333	0	25220	1
SCS-01_2-3	86	1	46	0	216000	1	43	0	1400	1	114	0	52300	1	386	0	0.344	0	390	0
SCS-02_0-1	89	1	45	0	31300	1	41	0	628	0	108	0	39400	0	379	1	0.333	0	370	0
SCS-02_2-3	82	1	49	0	149000	1	45	0	1000	1	119	0	43400	0	406	0	0.361	0	410	0
SCS-03_0-1	88	1	45	0	121000	1	42	0	618	0	107	0	38800	0	362	0	0.336	0	380	0
SCS-03_2-3	85	1	47	0	117000	1	43	0	650	0	112	0	44200	1	381	0	0.348	0	390	0
SCS-04_0-1	88	1	45	0	68200	1	42	0	628	0	108	0	50400	1	682	1	10.28	1	380	0
SCS-04_2-3	86	1	46	0	30200	1	43	0	655	0	113	0	41100	0	384	0	0.344	0	390	0
SCS-05_0-1	92	1	43	0	40100	1	40	0	615	0	106	0	38600	0	361	0	0.322	0	360	0
SCS-05_2-3	86	1	46	0	53600	1	43	0	660	0	114	0	43500	1	387	0	0.344	0	390	0
SCS-06_0-1	91	1	44	0	86600	1	40	0	616	0	106	0	38600	0	361	0	0.325	0	370	0
SCS-06_2-3	90	1	44	0	32900	1	41	0	606	0	105	0	42600	1	355	0	0.329	0	370	0
SCS-07_0-1	87	1	46	0	84000	1	42	0	656	0	113	0	41200	0	385	0	0.34	0	380	0
SCS-07_2-3	87	1	46	0	92800	1	42	0	657	0	113	0	41200	0	385	0	0.34	0	380	0
SCS-08_0-1	87	1	46	0	64500	1	42	0	654	0	113	0	41000	0	383	0	0.34	0	380	0
SCS-08_2-3	84	1	48	0	67200	1	44	0	659	0	114	0	41300	0	386	0	0.352	0	400	0
SCS-09_0-1	91	1	44	0	39000	1	40	0	631	0	109	0	39600	0	370	0	0.325	0	370	0
SCS-09_2-3	92	1	43	0	38200	1	40	0	624	0	108	0	39200	0	366	0	0.322	0	360	0
SCS-10_0-1	85	1	47	0	36500	1	43	0	657	0	113	0	41300	0	385	0	0.348	0	390	0
SCS-10_2-3	82	1	49	0	208000	1	45	0	1000	1	112	0	40700	0	380	0	0.361	0	410	0
SSA-01_0-1	92	1	51	0	64000	1	47	0	711	0	123	0	44600	0	417	0	0.379	0	430	0
SSA-01_0-1-D	91	1	44	0	53400	1	40	0	595	1	103	0	37300	0	349	0	0.326	0	370	0
SSA-01_2-3	99	1	40	0	37700	1	37	0	534	0	92	0	87100	1	313	0	0.299	0	340	0
SSA-02_0-1	86	1	46	0	13400	0	43	0	669	0	115	0	42000	0	392	0	4.03	1	390	0
SSA-02_0-1-D	85	1	47	0	44500	1	43	0	643	1	986	1	40300	0	377	0	0.348	0	390	0
SSA-02_2-3	79	1	51	0	62200	1	46	0	693	0	119	0	43500	0	406	0	0.375	0	420	0
SSA-03_0-1	91	1	44	0	46900	1	40	0	597	0	103	0	37500	0	350	0	12.1	1	370	0
SSA-03_0-1-D	91	1	44	0	55200	1	40	0	599	0	103	0	45300	1	351	0	0.326	0	370	0
SSA-03_2-3	93	1	43	0	36900	1	39	0	569	0	98.1	0	47500	1	334	0	0.318	0	360	0
SSA-04_0-1	91	1	44	0	37200	1	40	0	594	0	102	0	40000	1	348	0	0.325	0	370	0
SSA-04_0-1-D	91	1	44	0	42100	1	40	0	605	0	804	1	38000	0	355	0	0.326	0	370	0
SSA-04_2-3	90	1	44	0	38500	1	41	0	615	0	106	0	38600	0	360	0	0.329	0	370	0
SSA-05_0-1	90	1	44	0	53400	1	41	0	633	0	109	0	39700	0	371	0	0.329	0	370	0
SSA-05_2-3	93	1	43	0	86000	1	39	0	601	1	100	0	58500	1	340	0	0.319	0	360	0
SSA-06_0-1	87	1	46	0	93500	1	42	0	607	0	105	0	38100	0	356	0	2.93	1	380	0
SSA-06_2-3	87	1	46	0	70700	1	42	0	604	0	104	0	37900	0	354	0	0.34	0	380	0
SSA-07_0-1	95	1	42	0	39800	1	39	0	580	0	100	0	36400	0	340	0	0.312	0	350	0
SSA-07_2-3	94	1	42	0	19500	1	39	0	593	0	102	0	37200	0	348	0	0.315	0	350	0
SSA-08_0-1	90	1	44	0	65000	1	41	0	590	0	102	0	37000	0	346	0	0.329	0	370	0
SSA-08_2-3	88	1	45	0	87800	1	42	0	601	0	104	0	37700	0	353	0	0.336	0	380	0
SSA-09_0-1	90	1	44	0	67100	1	41	0	628	0	108	0	39400	0	368	0	0.329	0	370	0
SSA-09_2-3	90	1	44	0	35700	1	41	0	624	0	108	0	46300	1	366	0	0.329	0	370	0
SSA-10_0-1	92	1	43	0	32700	1	40	0	606	0	105	0	40300	1	355	0	0.322	0	360	0
SSA-10_2-3	92	1	43	0	52700	1	40	0	577	0	99.4	0	36200	0	338	0	0.322	0	360	0

SAMPLES	TRICHLOROFLUOROMETHANE	D_TRICHLOROFLUOROMETHANE	VANADIUM	D_VANADIUM	ZINC	D_ZINC
BEA-BG-SB-SSB-01-03	5	1	7600	1	14000	1
BEA-BG-SB-SSB-02-03	2	0	4900	1	2300	1
BEA-BG-SB-SSB-03-03	2	0	4800	1	2700	1
BEA-BG-SB-SSB-04-03	2	0	4200	1	190	0
BEA-BG-SB-SSB-05-03	2	0	5600	1	2700	1
BEA-BG-SB-SSB-06-03	2	0	2200	1	1600	1
BEA-BG-SB-SSB-07-03	2	0	11100	1	8800	1
BEA-BG-SB-SSB-08-03	2	0	6100	1	2700	1
BEA-BG-SB-SSB-09-03	2	0	8300	1	1900	1
BEA-BG-SB-SSB-10-03	2	0	3500	1	150	0
BEA-BG-SS-SSB-01-01	2	1	4300	1	9400	1
BEA-BG-SS-SSB-02-01	2	0	8000	1	18000	1
BEA-BG-SS-SSB-03-01	2	0	7800	1	5100	1
BEA-BG-SS-SSB-03-01-D	4	1	7900	1	5000	1
BEA-BG-SS-SSB-04-01	2	0	6300	1	5300	1
BEA-BG-SS-SSB-04-01-D	2	0	5800	1	7500	1
BEA-BG-SS-SSB-05-01	2	0	3200	1	3200	1
BEA-BG-SS-SSB-06-01	4	1	3200	1	3400	1
BEA-BG-SS-SSB-07-01	2	0	8000	1	6700	1
BEA-BG-SS-SSB-08-01	2	0	11500	1	5800	1
BEA-BG-SS-SSB-09-01	2	0	6800	1	3200	1
BEA-BG-SS-SSB-10-01	7	1	4300	1	2500	1
SCS-01_0-1	0.49	0	3610	1	1750	1
SCS-01_2-3	0.58	0	23200	1	205	0
SCS-02_0-1	0.43	0	3290	1	2080	1
SCS-02_2-3	0.75	0	16900	1	215	0
SCS-03_0-1	0.5	0	5030	1	9350	1
SCS-03_2-3	0.51	0	4900	1	202	0
SCS-04_0-1	0.48	0	10300	1	14400	1
SCS-04_2-3	0.68	0	2900	1	203	0
SCS-05_0-1	0.53	0	1770	1	191	0
SCS-05_2-3	0.68	0	4700	1	205	0
SCS-06_0-1	0.65	0	4090	1	191	0
SCS-06_2-3	0.6	0	2360	1	188	0
SCS-07_0-1	0.68	0	3890	1	11100	1
SCS-07_2-3	0.7	0	4000	1	204	0
SCS-08_0-1	0.68	0	4010	1	1830	1
SCS-08_2-3	0.6	0	3300	1	204	0
SCS-09_0-1	0.75	0	4450	1	2970	1
SCS-09_2-3	0.67	0	4500	1	194	0
SCS-10_0-1	0.66	0	5960	1	2100	1
SCS-10_2-3	0.57	0	22300	1	201	0
SSA-01_0-1	0.65	0	5710	1	221	0
SSA-01_0-1-D	0.63	0	6490	1	185	0
SSA-01_2-3	0.52	0	5270	1	166	0
SSA-02_0-1	0.52	0	323	1	208	0
SSA-02_0-1-D	0.56	0	2750	1	199	0
SSA-02_2-3	0.51	0	3890	1	215	0
SSA-03_0-1	0.47	0	7120	1	185	0
SSA-03_0-1-D	0.59	0	7790	1	186	0
SSA-03_2-3	0.51	0	3180	1	177	0
SSA-04_0-1	0.52	0	3940	1	184	0
SSA-04_0-1-D	0.64	0	4090	1	188	0
SSA-04_2-3	0.48	0	4360	1	191	0
SSA-05_0-1	0.52	0	4410	1	196	0
SSA-05_2-3	0.54	0	11100	1	180	0
SSA-06_0-1	0.47	0	6000	1	188	0
SSA-06_2-3	0.47	0	5450	1	188	0
SSA-07_0-1	0.54	0	2660	1	180	0
SSA-07_2-3	0.56	0	1330	1	184	0
SSA-08_0-1	0.49	0	5280	1	183	0
SSA-08_2-3	0.48	0	5320	1	187	0
SSA-09_0-1	0.68	0	3980	1	195	0
SSA-09_2-3	0.65	0	3630	1	194	0
SSA-10_0-1	0.66	0	4900	1	188	0
SSA-10_2-3	0.64	0	5790	1	179	0

Appendix A2
Sediment Background Data

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Appendix A2
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	ALUMINUM	D_ALUMINUM	ARSENIC	D_ARSENIC	BARIUM	D_BARIUM	BERYLLIUM	D_BERYLLIUM	CALCIUM	D_CALCIUM	CARBON DISULFIDE	D_CARBON DISULFIDE	CHROMIUM	D_CHROMIUM	COBALT	D_COBALT	COPPER	D_COPPER
CSA-01	888000	1	838	0	2900	1	116	0	565000	1	130	1	1330	1	173	0	1570	1
CSA-01-D	1050000	1	1010	0	2910	1	140	0	823000	1	34	1	1710	1	209	0	2110	1
CSA-02	1770000	1	1240	0	7970	1	171	0	1280000	1	650	1	2430	1	384	1	1810	1
CSA-03	938000	1	771	0	2230	1	106	0	387000	1	2.7	1	2060	1	160	0	23000	1
CSA-04	4200000	1	2270	1	18600	1	111	0	441000	1	220	1	6760	1	360	1	2320	1
CSA-05	1680000	1	1340	0	4140	1	185	0	1960000	1	1200	1	3680	1	462	1	3100	1
CSA-06	6690000	1	3420	1	13000	1	385	1	1050000	1	1400	1	10000	1	1120	1	6280	1
CSA-07	7090000	1	5660	1	10400	1	416	1	1660000	1	1400	1	13500	1	2330	1	12700	1
CSA-08	6560000	1	5050	1	9740	1	380	1	1420000	1	830	1	13700	1	1900	1	8240	1
CSA-09	4210000	1	5130	1	6250	1	165	1	787000	1	850	1	8810	1	1390	1	5930	1
CSA-10	1520000	1	990	1	3850	1	110	0	1240000	1	240	1	2340	1	261	1	1660	1

Notes:

Concentrations reported with at "0" in their corresponding "D_Parameter" column are non-detects.

Concentrations reported with a "1" in their corresponding "D_Parameter" Column are positive detects.

Units are microgram per kilogram (μg/kg)

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Appendix A2
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	ENDRIN KETONE	D_ENDRIN KETONE	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE	IRON	D_IRON	LEAD	D_LEAD	MAGNESIUM	D_MAGNESIUM	MANGANESE	D_MANGANESE	MERCURY	D_MERCURY	METHOXYCHLOR
CSA-01	12	1	50	0	501000	1	5940	1	728000	1	3600	1	74	1	1.71
CSA-01-D	18.3	1	63	0	486000	1	6510	1	1090000	1	6980	1	190	1	2.13
CSA-02	12.9	1	72	0	1660000	1	2860	1	1530000	1	6140	1	170	1	2.45
CSA-03	0.272	0	48	0	889000	1	5720	1	688000	1	4440	1	27	1	1.63
CSA-04	0.261	0	46	0	3070000	1	3940	1	932000	1	6490	1	290	1	1.57
CSA-05	0.447	0	79	0	1990000	1	4440	1	1760000	1	15100	1	170	1	2.69
CSA-06	0.335	0	60	0	6720000	1	12700	1	3400000	1	35400	1	190	1	2.01
CSA-07	0.408	0	72	0	10200000	1	9470	1	2930000	1	51800	1	220	1	22.4
CSA-08	0.417	0	74	0	9260000	1	9000	1	3110000	1	67900	1	120	1	2.51
CSA-09	0.348	0	62	0	7670000	1	4180	1	2290000	1	27100	1	52	1	2.09
CSA-10	76.5	1	46	0	2520000	1	1490	1	348000	1	8460	1	33	1	362

Appendix A2
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	D_METHOXYCHLOR	METHYL_ACETATE	D_METHYL_ACETATE	NICKEL	D_NICKEL	POTASSIUM	D_POTASSIUM	SELENIUM	D_SELENIUM	SODIUM	D_SODIUM	THALLIUM	D_THALLIUM	VANADIUM	D_VANADIUM	ZINC	D_ZINC
CSA-01	0	3.3	1	477	1	225000	1	838	0	3080000	1	491	0	2480	1	3500	1
CSA-01-D	0	0.99	0	524	1	359000	1	1010	0	5210000	1	593	0	2580	1	4150	1
CSA-02	0	1.9	0	746	1	411000	1	1240	0	5580000	1	725	0	3730	1	4050	1
CSA-03	0	0.89	0	705	1	327000	1	771	0	3420000	1	452	0	2970	1	52100	1
CSA-04	0	0.62	0	1250	1	666000	1	802	0	3710000	1	470	0	10200	1	4870	1
CSA-05	0	2.1	0	1160	1	406000	1	1340	0	3090000	1	786	0	6060	1	12300	1
CSA-06	0	1.3	0	2400	1	1750000	1	972	0	14900000	1	570	0	15500	1	19900	1
CSA-07	1	2	0	3970	1	1850000	1	1620	1	9130000	1	707	0	22700	1	55200	1
CSA-08	0	1.9	0	3490	1	2060000	1	1670	1	11200000	1	718	0	19400	1	27100	1
CSA-09	0	1.2	0	2140	1	1550000	1	1120	1	10200000	1	623	0	13400	1	19700	1
CSA-10	1	0.89	0	701	1	134000	1	798	0	135000	1	468	0	3450	1	4790	1

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Appendix B
Documentation of Outlier Testing

Appendix B1: **Soil Outlier Test Iterations**
Appendix B2: **Soil Q-Q Plots**
Appendix B3: **Sediment Outlier Test Iterations**
Appendix B4: **Sediment Q-Q Plots**

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Appendix B1
Soil Outlier Test Iterations
Iterations 1 through 7

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Outlier Tests for Selected Variables excluding nondetects

ITERATION 1

User Selected Options

Date/Time of Computation	4/21/2015 1:35:40 PM
From File	A1 Soil ProUCL Dataset.xls
Full Precision	ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.
For 5% significance level, 12.1 is not an outlier.
For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.
For 5% significance level, 2.4 is not an outlier.
For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.
For 5% significance level, 5.2 is not an outlier.
For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 66
Number NDs = 46
Number Detects = 20
10% critical value: 0.401
5% critical value: 0.45
1% critical value: 0.535
Note: NDs excluded from Outlier Test

1. Data Value 280 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.972

For 10% significance level, 280 is an outlier.
For 5% significance level, 280 is an outlier.
For 1% significance level, 280 is an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**4196742**
SD of Detects	**2286834**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4196742	2269443	12100000	24	3.482	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 12100000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	**66**
Number NDs	**17**
Number Detects	**49**
Mean of Detects	**1083**
SD of Detects	**555.9**
Number of data	**49**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1083	550.2	3300	18	4.029	3.12	3.47

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3300 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**11213**
SD of Detects	**6791**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66

Number NDs = 63

Number Detects = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1900 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.751

For 10% significance level, 1900 is an outlier.
For 5% significance level, 1900 is not an outlier.
For 1% significance level, 1900 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.056

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.683

For 10% significance level, 1500 is an outlier.
For 5% significance level, 1500 is not an outlier.
For 1% significance level, 1500 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.073

For 10% significance level, 66 is not an outlier.
For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**66**
Number NDs	**24**
Number Detects	**42**
Mean of Detects	**128.6**
SD of Detects	**52.58**
Number of data	**42**
Number of suspected outliers	**1**

NDs not included in the following:

Potential	Obs.	Test	Critical	Critical

#	Mean	sd	outlier	Number	value	value (5%)	value (1%)
1	128.6	51.95	288	20	3.068	3.06	3.4

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 288 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**66**
Number NDs	**27**
Number Detects	**39**
Mean of Detects	**2473221**
SD of Detects	**7632135**
Number of data	**39**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2473221	7533652	43300000	10	5.419	3.03	3.37

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 43300000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**39.4**
SD of Detects	**51.13**
Number of data	**28**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	39.4	50.21	230	5	3.796	2.88	3.2

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 230 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**4550**
SD of Detects	**2618**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4550	2598	14300	26	3.753	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 14300 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66

Number NDs = 63

Number Detects = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.
For 5% significance level, 2500 is not an outlier.
For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.
For 5% significance level, 180 is not an outlier.
For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**66**
Number NDs	**9**
Number Detects	**57**
Mean of Detects	**358.1**
SD of Detects	**230.6**
Number of data	**57**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	358.1	228.5	1200	11	3.684	3.179	3.536

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2299**
SD of Detects	**973.7**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 5800 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.854

For 10% significance level, 5800 is an outlier.
For 5% significance level, 5800 is an outlier.
For 1% significance level, 5800 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.031

For 10% significance level, 84 is not an outlier.
For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2420020**
SD of Detects	**1928381**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2420020	1913716	11200000	24	4.588	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 11200000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**4918**
SD of Detects	**3530**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4918	3503	20400	11	4.42	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 20400 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**171507**
SD of Detects	**177259**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	171507	175911	1040000	7	4.937	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1040000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**15474**
SD of Detects	**16353**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	15474	16228	80100	27	3.982	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 80100 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	**66**
Number NDs	**28**
Number Detects	**38**
Mean of Detects	**209.6**
SD of Detects	**150.3**
Number of data	**38**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	209.6	148.3	770	21	3.779	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 770 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	**66**
Number NDs	**4**
Number Detects	**62**
Mean of Detects	**1240**
SD of Detects	**727.2**
Number of data	**62**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1240	721.3	3600	12	3.272	3.212	3.572

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 3600 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**88.09**
SD of Detects	**4.464**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.09	4.43	72	15	3.632	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 72 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for PHENANTHRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.904

For 10% significance level, 3200 is an outlier.
For 5% significance level, 3200 is not an outlier.
For 1% significance level, 3200 is not an outlier.

2. Data Value 92 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.096

For 10% significance level, 92 is not an outlier.
For 5% significance level, 92 is not an outlier.
For 1% significance level, 92 is not an outlier.

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	**66**
Number NDs	**3**
Number Detects	**63**
Mean of Detects	**91770**
SD of Detects	**87330**
Number of data	**63**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	91770	86635	570000	6	5.52	3.218	3.578

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 570000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3

10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988

Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.
For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.
For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 66
Number NDs = 49
Number Detects = 17
10% critical value: 0.438
5% critical value: 0.49
1% critical value: 0.577
Note: NDs excluded from Outlier Test

1. Data Value 549000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.845

For 10% significance level, 549000 is an outlier.
For 5% significance level, 549000 is an outlier.
For 1% significance level, 549000 is an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.032

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

Dixon's Outlier Test for THALLIUM

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 682 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.977

For 10% significance level, 682 is an outlier.
For 5% significance level, 682 is an outlier.
For 1% significance level, 682 is not an outlier.

2. Data Value 379 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.023

For 10% significance level, 379 is not an outlier.
For 5% significance level, 379 is not an outlier.
For 1% significance level, 379 is not an outlier.

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.
For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.
For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 25220 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.843

For 10% significance level, 25220 is an outlier.
For 5% significance level, 25220 is an outlier.
For 1% significance level, 25220 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.039

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**5843**
SD of Detects	**4030**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5843	3999	23200	24	4.34	3.236	3.596

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 23200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

ITERATION 2

User Selected Options

Date/Time of Computation	4/21/2015 1:50:31 PM
From File	A1 Soil ProUCL Dataset.xls
Full Precision	ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.
For 5% significance level, 12.1 is not an outlier.
For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.
For 5% significance level, 2.4 is not an outlier.
For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.
For 5% significance level, 5.2 is not an outlier.
For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 65
Number NDs = 46
Number Detects = 19
10% critical value: 0.412
5% critical value: 0.462
1% critical value: 0.547
Note: NDs excluded from Outlier Test

1. Data Value 11.9 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.595

For 10% significance level, 11.9 is an outlier.
For 5% significance level, 11.9 is an outlier.
For 1% significance level, 11.9 is an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.132

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**4075154**
SD of Detects	**2078544**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4075154	2062494	10900000	25	3.309	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 10900000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	**65**
Number NDs	**17**
Number Detects	**48**
Mean of Detects	**1037**
SD of Detects	**457.1**
Number of data	**48**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1037	452.3	2400	18	3.013	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**11213**
SD of Detects	**6791**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 540 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.776

For 10% significance level, 540 is not an outlier.
For 5% significance level, 540 is not an outlier.
For 1% significance level, 540 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.224

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.771

For 10% significance level, 520 is not an outlier.
For 5% significance level, 520 is not an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 66 is not an outlier.
For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**65**
Number NDs	**24**
Number Detects	**41**
Mean of Detects	**124.7**
SD of Detects	**46.72**
Number of data	**41**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	124.7	46.15	270	6	3.147	3.05	3.39

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 270 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**65**
Number NDs	**27**
Number Detects	**38**
Mean of Detects	**1398832**
SD of Detects	**3686318**
Number of data	**38**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1398832	3637491	21000000	16	5.389	3.01	3.36

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 21000000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	**65**
Number NDs	**38**
Number Detects	**27**
Mean of Detects	**32.34**
SD of Detects	**35.58**
Number of data	**27**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.34	34.92	100	3	1.938	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**4400**
SD of Detects	**2335**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4400	2317	13800	41	4.057	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 13800 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66

Number NDs = 63

Number Detects = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.

For 5% significance level, 2500 is not an outlier.

For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.

For 5% significance level, 180 is not an outlier.

For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**65**
Number NDs	**9**
Number Detects	**56**
Mean of Detects	**343**
SD of Detects	**202.5**
Number of data	**56**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	343	200.7	1000	7	3.274	3.172	3.528

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2299**
SD of Detects	**973.7**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 920 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.789

For 10% significance level, 920 is not an outlier.
For 5% significance level, 920 is not an outlier.
For 1% significance level, 920 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 84 is not an outlier.
For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**2284943**
SD of Detects	**1598038**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2284943	1585698	8000000	41	3.604	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 8000000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**4680**
SD of Detects	**2975**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4680	2952	16200	11	3.902	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 16200 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**158146**
SD of Detects	**141226**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	158146	140135	1000000	11	6.007	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 1000000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**14480**
SD of Detects	**14329**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	14480	14218	75800	12	4.313	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 75800 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	**65**
Number NDs	**28**
Number Detects	**37**
Mean of Detects	**194.5**
SD of Detects	**119.4**
Number of data	**37**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	194.5	117.8	540	17	2.934	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	**65**
Number NDs	**4**
Number Detects	**61**
Mean of Detects	**1201**
SD of Detects	**665.8**
Number of data	**61**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1201	660.4	3300	8	3.178	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**88.34**
SD of Detects	**4.017**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.34	3.986	99	44	2.675	3.23	3.59

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for PHENANTHRENE

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	**65**
Number NDs	**3**
Number Detects	**62**
Mean of Detects	**84056**
SD of Detects	**62785**
Number of data	**62**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	84056	62276	390000	9	4.913	3.212	3.572

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 390000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.

For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.
For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 65
Number NDs = 49
Number Detects = 16
10% critical value: 0.454
5% critical value: 0.507
1% critical value: 0.595
Note: NDs excluded from Outlier Test

1. Data Value 218000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.661

For 10% significance level, 218000 is an outlier.
For 5% significance level, 218000 is an outlier.
For 1% significance level, 218000 is an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.042

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.

For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.
For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 4087 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.752

For 10% significance level, 4087 is not an outlier.
For 5% significance level, 4087 is not an outlier.
For 1% significance level, 4087 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.248

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**5576**
SD of Detects	**3423**
Number of data	**65**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5576	3396	22300	41	4.924	3.23	3.59

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 22300 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

ITERATION 3

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	4/21/2015 1:56:01 PM
From File	A1 Soil ProUCL Dataset.xls
Full Precision	ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.
For 5% significance level, 12.1 is not an outlier.
For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.
For 5% significance level, 2.4 is not an outlier.
For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.
For 5% significance level, 5.2 is not an outlier.
For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 64
Number NDs = 46
Number Detects = 18
10% critical value: 0.424
5% critical value: 0.475
1% critical value: 0.561
Note: NDs excluded from Outlier Test

1. Data Value 9.21 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.591

For 10% significance level, 9.21 is an outlier.
For 5% significance level, 9.21 is an outlier.
For 1% significance level, 9.21 is an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.168

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N	**64**
Number NDs	**0**
Number Detects	**64**
Mean of Detects	**3968516**
SD of Detects	**1907362**
Number of data	**64**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3968516	1892402	10200000	2	3.293	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 10200000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	**65**

Number NDs	**17**
Number Detects	**48**
Mean of Detects	**1037**
SD of Detects	**457.1**
Number of data	**48**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1037	452.3	2400	18	3.013	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**11213**
SD of Detects	**6791**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 540 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.776

For 10% significance level, 540 is not an outlier.
For 5% significance level, 540 is not an outlier.
For 1% significance level, 540 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.224

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.771

For 10% significance level, 520 is not an outlier.
For 5% significance level, 520 is not an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 66 is not an outlier.
For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**64**
Number NDs	**24**
Number Detects	**40**
Mean of Detects	**121.1**
SD of Detects	**41.04**
Number of data	**40**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	121.1	40.53	265	22	3.55	3.04	3.38

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 265 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**64**
Number NDs	**27**
Number Detects	**37**
Mean of Detects	**869070**
SD of Detects	**1733663**
Number of data	**37**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	869070	1710074	9810000	10	5.228	3	3.34

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 9810000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	**65**
Number NDs	**38**

Number Detects	**27**
Mean of Detects	**32.34**
SD of Detects	**35.58**
Number of data	**27**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.34	34.92	100	3	1.938	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	**64**
Number NDs	**0**
Number Detects	**64**
Mean of Detects	**4254**
SD of Detects	**2028**
Number of data	**64**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4254	2012	11800	24	3.751	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 11800 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.
For 5% significance level, 2500 is not an outlier.
For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.
For 5% significance level, 180 is not an outlier.
For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**64**
Number NDs	**9**
Number Detects	**55**
Mean of Detects	**331.1**
SD of Detects	**183.4**
Number of data	**55**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	331.1	181.7	1000	7	3.681	3.165	3.52

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 1000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2299**
SD of Detects	**973.7**
Number of data	**66**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 920 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.789

For 10% significance level, 920 is not an outlier.
For 5% significance level, 920 is not an outlier.
For 1% significance level, 920 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 84 is not an outlier.
For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**64**
Number NDs	**0**
Number Detects	**64**
Mean of Detects	**2195645**
SD of Detects	**1437956**
Number of data	**64**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2195645	1426678	7990000	25	4.061	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 7990000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	**64**
Number NDs	**0**
Number Detects	**64**
Mean of Detects	**4500**
SD of Detects	**2618**
Number of data	**64**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4500	2597	15500	1	4.236	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 15500 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	**64**
Number NDs	**0**
Number Detects	**64**

Mean of Detects	**144992**
SD of Detects	**94000**
Number of data	**64**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	144992	93263	567000	17	4.525	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 567000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	**64**
Number NDs	**0**
Number Detects	**64**
Mean of Detects	**13522**
SD of Detects	**12164**
Number of data	**64**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	13522	12069	72500	35	4.887	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 72500 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	**65**
Number NDs	**28**
Number Detects	**37**
Mean of Detects	**194.5**
SD of Detects	**119.4**
Number of data	**37**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	194.5	117.8	540	17	2.934	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	65
Number NDs	4
Number Detects	61
Mean of Detects	1201
SD of Detects	665.8
Number of data	61
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1201	660.4	3300	8	3.178	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	65
Number NDs	0
Number Detects	65
Mean of Detects	88.34
SD of Detects	4.017
Number of data	65
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.34	3.986	99	44	2.675	3.23	3.59

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for PHENANTHRENE

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	64
Number NDs	3
Number Detects	61
Mean of Detects	79041

SD of Detects 49214
Number of data 61
Number of suspected outliers 1
NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	79041	48809	282000	15	4.158	3.206	3.566

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 282000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.

For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.
For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.
For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 64
Number NDs = 49
Number Detects = 15
10% critical value: 0.472
5% critical value: 0.525
1% critical value: 0.616
Note: NDs excluded from Outlier Test

1. Data Value 121000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.432

For 10% significance level, 121000 is not an outlier.
For 5% significance level, 121000 is not an outlier.
For 1% significance level, 121000 is not an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.055

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.
For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.
For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 4087 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.752

For 10% significance level, 4087 is not an outlier.
For 5% significance level, 4087 is not an outlier.
For 1% significance level, 4087 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.248

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**64**
Number NDs	**0**
Number Detects	**64**
Mean of Detects	**5314**
SD of Detects	**2719**
Number of data	**64**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5314	2697	16900	25	4.295	3.224	3.584

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 16900 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

OUTLIER ITERATION 4

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	4/21/2015 2:01:27 PM
From File	A1 Soil ProUCL Dataset.xls
Full Precision	ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.
For 5% significance level, 12.1 is not an outlier.
For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.
For 5% significance level, 2.4 is not an outlier.
For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.
For 5% significance level, 5.2 is not an outlier.
For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 63
Number NDs = 46
Number Detects = 17
10% critical value: 0.438
5% critical value: 0.49
1% critical value: 0.577
Note: NDs excluded from Outlier Test

1. Data Value 5.71 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.302

For 10% significance level, 5.71 is not an outlier.
For 5% significance level, 5.71 is not an outlier.
For 1% significance level, 5.71 is not an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.178

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N	63
Number NDs	0
Number Detects	63
Mean of Detects	3869603
SD of Detects	1749415
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3869603	1735475	9360000	39	3.164	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	65
Number NDs	17
Number Detects	48
Mean of Detects	1037
SD of Detects	457.1
Number of data	48
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1037	452.3	2400	18	3.013	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	66
Number NDs	0
Number Detects	66
Mean of Detects	11213
SD of Detects	6791
Number of data	66
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 540 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.776

For 10% significance level, 540 is not an outlier.
For 5% significance level, 540 is not an outlier.
For 1% significance level, 540 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.224

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.771

For 10% significance level, 520 is not an outlier.
For 5% significance level, 520 is not an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 66 is not an outlier.

For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**63**
Number NDs	**24**
Number Detects	**39**
Mean of Detects	**117.4**
SD of Detects	**34.21**
Number of data	**39**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	117.4	33.77	190	17	2.15	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**63**
Number NDs	**27**

Number Detects	36
Mean of Detects	620711
SD of Detects	862560
Number of data	36
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	620711	850495	5260000	7	5.455	2.99	3.33

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 5260000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	65
Number NDs	38
Number Detects	27
Mean of Detects	32.34
SD of Detects	35.58
Number of data	27
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.34	34.92	100	3	1.938	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	63
Number NDs	0
Number Detects	63
Mean of Detects	4134
SD of Detects	1802
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4134	1787	10100	7	3.338	3.218	3.578

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 10100 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.
For 5% significance level, 2500 is not an outlier.
For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.
For 5% significance level, 180 is not an outlier.
For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**63**
Number NDs	**9**
Number Detects	**54**
Mean of Detects	**318.7**
SD of Detects	**160.2**
Number of data	**54**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	318.7	158.7	850	24	3.348	3.158	3.512

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 850 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	66
Number NDs	0
Number Detects	66
Mean of Detects	2299
SD of Detects	973.7
Number of data	66
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 920 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.789

For 10% significance level, 920 is not an outlier.
For 5% significance level, 920 is not an outlier.
For 1% significance level, 920 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 84 is not an outlier.
For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**2103671**
SD of Detects	**1245371**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2103671	1235447	5820000	20	3.008	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	**63**
Number NDs	**0**

Number Detects	**63**
Mean of Detects	**4325**
SD of Detects	**2232**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4325	2214	12700	26	3.783	3.218	3.578

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 12700 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**138293**
SD of Detects	**77849**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	138293	77229	357000	17	2.832	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**12586**
SD of Detects	**9662**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	12586	9585	44100	7	3.288	3.218	3.578

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 44100 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	**65**
Number NDs	**28**
Number Detects	**37**
Mean of Detects	**194.5**
SD of Detects	**119.4**
Number of data	**37**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	194.5	117.8	540	17	2.934	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	**65**
Number NDs	**4**
Number Detects	**61**
Mean of Detects	**1201**
SD of Detects	**665.8**
Number of data	**61**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1201	660.4	3300	8	3.178	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**88.34**
SD of Detects	**4.017**

Number of data	**65**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.34	3.986	99	44	2.675	3.23	3.59

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for PHENANTHRENE

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	**63**
Number NDs	**3**
Number Detects	**60**
Mean of Detects	**75658**
SD of Detects	**41872**
Number of data	**60**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	75658	41521	216000	19	3.38	3.2	3.56

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 216000 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.
For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.

For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 64
Number NDs = 49
Number Detects = 15
10% critical value: 0.472
5% critical value: 0.525
1% critical value: 0.616
Note: NDs excluded from Outlier Test

1. Data Value 121000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.432

For 10% significance level, 121000 is not an outlier.
For 5% significance level, 121000 is not an outlier.
For 1% significance level, 121000 is not an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.055

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.
For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.

For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 4087 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.752

For 10% significance level, 4087 is not an outlier.
For 5% significance level, 4087 is not an outlier.
For 1% significance level, 4087 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.248

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**5131**
SD of Detects	**2305**
Number of data	**63**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5131	2286	11500	20	2.786	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

OUTLIER ITERATION 5

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	4/21/2015 2:04:33 PM
From File	A1 Soil ProUCL Dataset.xls
Full Precision	ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66

Number NDs = 62

Number Detects = 4

10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.
For 5% significance level, 12.1 is not an outlier.
For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.
For 5% significance level, 2.4 is not an outlier.
For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.
For 5% significance level, 5.2 is not an outlier.
For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 63
Number NDs = 46
Number Detects = 17
10% critical value: 0.438
5% critical value: 0.49
1% critical value: 0.577

Note: NDs excluded from Outlier Test

1. Data Value 5.71 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.302

For 10% significance level, 5.71 is not an outlier.
For 5% significance level, 5.71 is not an outlier.
For 1% significance level, 5.71 is not an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.178

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**3869603**
SD of Detects	**1749415**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3869603	1735475	9360000	39	3.164	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	**65**
Number NDs	**17**
Number Detects	**48**
Mean of Detects	**1037**
SD of Detects	**457.1**
Number of data	**48**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1037	452.3	2400	18	3.013	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**11213**
SD of Detects	**6791**
Number of data	**66**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 540 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.776

For 10% significance level, 540 is not an outlier.
For 5% significance level, 540 is not an outlier.
For 1% significance level, 540 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.224

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.771

For 10% significance level, 520 is not an outlier.
For 5% significance level, 520 is not an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 66 is not an outlier.
For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**63**
Number NDs	**24**
Number Detects	**39**
Mean of Detects	**117.4**
SD of Detects	**34.21**
Number of data	**39**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	117.4	33.77	190	17	2.15	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**62**
Number NDs	**27**
Number Detects	**35**
Mean of Detects	**488160**
SD of Detects	**338786**
Number of data	**35**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	488160	333911	1390000	1	2.701	2.98	3.32

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	**65**
Number NDs	**38**
Number Detects	**27**
Mean of Detects	**32.34**
SD of Detects	**35.58**
Number of data	**27**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.34	34.92	100	3	1.938	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	**62**
Number NDs	**0**
Number Detects	**62**
Mean of Detects	**4037**
SD of Detects	**1645**
Number of data	**62**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4037	1632	8030	36	2.447	3.212	3.572

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.
For 5% significance level, 2500 is not an outlier.
For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.
For 5% significance level, 180 is not an outlier.
For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**62**
Number NDs	**9**
Number Detects	**53**

Mean of Detects	**308.7**
SD of Detects	**143.6**
Number of data	**53**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	308.7	142.3	810	17	3.524	3.151	3.504

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 810 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2299**
SD of Detects	**973.7**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66

Number NDs = 63

Number Detects = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 920 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.789

For 10% significance level, 920 is not an outlier.
For 5% significance level, 920 is not an outlier.
For 1% significance level, 920 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 84 is not an outlier.
For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**2103671**

SD of Detects	1245371
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2103671	1235447	5820000	20	3.008	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	62
Number NDs	0
Number Detects	62
Mean of Detects	4190
SD of Detects	1973
Number of data	62
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4190	1957	9600	10	2.764	3.212	3.572

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	63
Number NDs	0
Number Detects	63
Mean of Detects	138293
SD of Detects	77849
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	138293	77229	357000	17	2.832	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	62
Number NDs	0
Number Detects	62
Mean of Detects	12077
SD of Detects	8851
Number of data	62
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	12077	8779	40600	32	3.249	3.212	3.572

For 5% Significance Level, there is 1 Potential Outlier

Therefore, Observation 40600 is a Potential Statistical Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	65
Number NDs	28
Number Detects	37
Mean of Detects	194.5
SD of Detects	119.4
Number of data	37
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	194.5	117.8	540	17	2.934	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	65
Number NDs	4
Number Detects	61
Mean of Detects	1201
SD of Detects	665.8
Number of data	61
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1201	660.4	3300	8	3.178	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	**65**
Number NDs	**0**
Number Detects	**65**
Mean of Detects	**88.34**
SD of Detects	**4.017**
Number of data	**65**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.34	3.986	99	44	2.675	3.23	3.59

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for PHENANTHRENE

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	**62**
Number NDs	**3**
Number Detects	**59**
Mean of Detects	**73280**
SD of Detects	**37923**
Number of data	**59**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	73280	37600	208000	36	3.583	3.193	3.552

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 208000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3

10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.
For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.
For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 64
Number NDs = 49
Number Detects = 15
10% critical value: 0.472
5% critical value: 0.525
1% critical value: 0.616
Note: NDs excluded from Outlier Test

1. Data Value 121000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.432

For 10% significance level, 121000 is not an outlier.
For 5% significance level, 121000 is not an outlier.
For 1% significance level, 121000 is not an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.055

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482

5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.
For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.
For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 4087 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.752

For 10% significance level, 4087 is not an outlier.
For 5% significance level, 4087 is not an outlier.
For 1% significance level, 4087 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.248

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**5131**
SD of Detects	**2305**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5131	2286	11500	20	2.786	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

OUTLIER ITERATION 6

nn Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation 4/21/2015 2:06:30 PM

From File A1 Soil ProUCL Dataset.xls

Full Precision ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66

Number NDs = 62

Number Detects = 4

10% critical value: 0.679

5% critical value: 0.765

1% critical value: 0.889

Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.

For 5% significance level, 12.1 is not an outlier.

For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.

For 5% significance level, 2.4 is not an outlier.

For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66

Number NDs = 61

Number Detects = 5

10% critical value: 0.557

5% critical value: 0.642

1% critical value: 0.78

Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.

For 5% significance level, 5.2 is not an outlier.

For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 63
Number NDs = 46
Number Detects = 17
10% critical value: 0.438
5% critical value: 0.49
1% critical value: 0.577
Note: NDs excluded from Outlier Test

1. Data Value 5.71 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.302

For 10% significance level, 5.71 is not an outlier.
For 5% significance level, 5.71 is not an outlier.
For 1% significance level, 5.71 is not an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.178

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**3869603**
SD of Detects	**1749415**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3869603	1735475	9360000	39	3.164	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	**65**
Number NDs	**17**
Number Detects	**48**
Mean of Detects	**1037**
SD of Detects	**457.1**
Number of data	**48**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1037	452.3	2400	18	3.013	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**11213**
SD of Detects	**6791**
Number of data	**66**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66

Number NDs = 63

Number Detects = 3

10% critical value: 0.886

5% critical value: 0.941

1% critical value: 0.988

Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.
For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 540 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.776

For 10% significance level, 540 is not an outlier.
For 5% significance level, 540 is not an outlier.
For 1% significance level, 540 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.224

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.771

For 10% significance level, 520 is not an outlier.
For 5% significance level, 520 is not an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 66 is not an outlier.
For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**63**
Number NDs	**24**
Number Detects	**39**
Mean of Detects	**117.4**
SD of Detects	**34.21**
Number of data	**39**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)

1	117.4	33.77	190	17	2.15	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**62**
Number NDs	**27**
Number Detects	**35**
Mean of Detects	**488160**
SD of Detects	**338786**
Number of data	**35**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	488160	333911	1390000	1	2.701	2.98	3.32

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	**65**
Number NDs	**38**
Number Detects	**27**
Mean of Detects	**32.34**
SD of Detects	**35.58**
Number of data	**27**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.34	34.92	100	3	1.938	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	**62**
Number NDs	**0**
Number Detects	**62**
Mean of Detects	**4037**
SD of Detects	**1645**
Number of data	**62**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4037	1632	8030	36	2.447	3.212	3.572

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.

For 5% significance level, 2500 is not an outlier.
For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.
For 5% significance level, 180 is not an outlier.
For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**61**
Number NDs	**9**
Number Detects	**52**
Mean of Detects	**299**
SD of Detects	**126.5**
Number of data	**52**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	299	125.3	620	16	2.561	3.144	3.496

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2299**
SD of Detects	**973.7**
Number of data	**66**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 920 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.789

For 10% significance level, 920 is not an outlier.
For 5% significance level, 920 is not an outlier.
For 1% significance level, 920 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 84 is not an outlier.

For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**2103671**
SD of Detects	**1245371**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2103671	1235447	5820000	20	3.008	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	**62**
Number NDs	**0**
Number Detects	**62**
Mean of Detects	**4190**
SD of Detects	**1973**
Number of data	**62**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4190	1957	9600	10	2.764	3.212	3.572

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	**63**
Number NDs	**0**

Number Detects	63
Mean of Detects	138293
SD of Detects	77849
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	138293	77229	357000	17	2.832	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	61
Number NDs	0
Number Detects	61
Mean of Detects	11610
SD of Detects	8116
Number of data	61
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11610	8049	35700	15	2.993	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	65
Number NDs	28
Number Detects	37
Mean of Detects	194.5
SD of Detects	119.4
Number of data	37
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	194.5	117.8	540	17	2.934	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	65
Number NDs	4
Number Detects	61
Mean of Detects	1201
SD of Detects	665.8
Number of data	61
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1201	660.4	3300	8	3.178	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	65
Number NDs	0
Number Detects	65
Mean of Detects	88.34
SD of Detects	4.017
Number of data	65
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.34	3.986	99	44	2.675	3.23	3.59

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for PHENANTHRENE

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	61
Number NDs	3
Number Detects	58
Mean of Detects	70957
SD of Detects	33756

Number of data **58**
Number of suspected outliers **1**
NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	70957	33464	199000	15	3.826	3.186	3.544

For 5% Significance Level, there is 1 Potential Outlier
Therefore, Observation 199000 is a Potential Statistical Outlier

For 1% Significance Level, there is 1 Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.

For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.
For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.
For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 64
Number NDs = 49
Number Detects = 15
10% critical value: 0.472
5% critical value: 0.525
1% critical value: 0.616
Note: NDs excluded from Outlier Test

1. Data Value 121000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.432

For 10% significance level, 121000 is not an outlier.
For 5% significance level, 121000 is not an outlier.
For 1% significance level, 121000 is not an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.055

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.
For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.
For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 4087 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.752

For 10% significance level, 4087 is not an outlier.
For 5% significance level, 4087 is not an outlier.
For 1% significance level, 4087 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.248

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**5131**
SD of Detects	**2305**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5131	2286	11500	20	2.786	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

OUTLIER ITERATION 7

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	4/21/2015 2:21:50 PM
From File	A1 Soil ProUCL Dataset.xls
Full Precision	ON

No Outlier Test for 2,4-D

No Outlier Test for 4,4'-DDD

Dixon's Outlier Test for 4,4'-DDE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 12.1 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.330

For 10% significance level, 12.1 is not an outlier.
For 5% significance level, 12.1 is not an outlier.
For 1% significance level, 12.1 is not an outlier.

2. Data Value 2.4 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.310

For 10% significance level, 2.4 is not an outlier.
For 5% significance level, 2.4 is not an outlier.
For 1% significance level, 2.4 is not an outlier.

Dixon's Outlier Test for 4,4'-DDT

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 5.2 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.097

For 10% significance level, 5.2 is not an outlier.
For 5% significance level, 5.2 is not an outlier.
For 1% significance level, 5.2 is not an outlier.

2. Data Value 1.8 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.332

For 10% significance level, 1.8 is not an outlier.
For 5% significance level, 1.8 is not an outlier.
For 1% significance level, 1.8 is not an outlier.

Dixon's Outlier Test for ALPHA-CHLORDANE

Total N = 63
Number NDs = 46
Number Detects = 17
10% critical value: 0.438
5% critical value: 0.49
1% critical value: 0.577
Note: NDs excluded from Outlier Test

1. Data Value 5.71 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.302

For 10% significance level, 5.71 is not an outlier.
For 5% significance level, 5.71 is not an outlier.
For 1% significance level, 5.71 is not an outlier.

2. Data Value 0.862 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.178

For 10% significance level, 0.862 is not an outlier.
For 5% significance level, 0.862 is not an outlier.
For 1% significance level, 0.862 is not an outlier.

Rosner's Outlier Test for 1 Outliers in ALUMINUM

Total N 63

Number NDs	0
Number Detects	63
Mean of Detects	3869603
SD of Detects	1749415
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	3869603	1735475	9360000	39	3.164	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for ANTHRACENE

Rosner's Outlier Test for 1 Outliers in ARSENIC

Total N	65
Number NDs	17
Number Detects	48
Mean of Detects	1037
SD of Detects	457.1
Number of data	48
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1037	452.3	2400	18	3.013	3.11	3.46

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in BARIUM

Total N	66
Number NDs	0
Number Detects	66
Mean of Detects	11213
SD of Detects	6791
Number of data	66
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11213	6739	32500	28	3.159	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for BENZALDEHYDE

Dixon's Outlier Test for BENZO(A)ANTHRACENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.829

For 10% significance level, 2200 is not an outlier.
For 5% significance level, 2200 is not an outlier.
For 1% significance level, 2200 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.171

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for BENZO(A)PYRENE

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.641

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 58 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.076

For 10% significance level, 58 is not an outlier.
For 5% significance level, 58 is not an outlier.

For 1% significance level, 58 is not an outlier.

Dixon's Outlier Test for BENZO(B)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 540 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.776

For 10% significance level, 540 is not an outlier.
For 5% significance level, 540 is not an outlier.
For 1% significance level, 540 is not an outlier.

2. Data Value 89 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.224

For 10% significance level, 89 is not an outlier.
For 5% significance level, 89 is not an outlier.
For 1% significance level, 89 is not an outlier.

No Outlier Test for BENZO(G,H,I)PERYLENE

Dixon's Outlier Test for BENZO(K)FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 520 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.771

For 10% significance level, 520 is not an outlier.
For 5% significance level, 520 is not an outlier.
For 1% significance level, 520 is not an outlier.

2. Data Value 66 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.229

For 10% significance level, 66 is not an outlier.
For 5% significance level, 66 is not an outlier.
For 1% significance level, 66 is not an outlier.

Rosner's Outlier Test for 1 Outliers in BERYLLIUM

Total N	**63**
Number NDs	**24**
Number Detects	**39**
Mean of Detects	**117.4**
SD of Detects	**34.21**
Number of data	**39**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	117.4	33.77	190	17	2.15	3.03	3.37

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CADMIUM

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 320 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.316

For 10% significance level, 320 is not an outlier.
For 5% significance level, 320 is not an outlier.
For 1% significance level, 320 is not an outlier.

2. Data Value 66.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.021

For 10% significance level, 66.5 is not an outlier.
For 5% significance level, 66.5 is not an outlier.
For 1% significance level, 66.5 is not an outlier.

Rosner's Outlier Test for 1 Outliers in CALCIUM

Total N	**62**
Number NDs	**27**
Number Detects	**35**
Mean of Detects	**488160**

SD of Detects	338786
Number of data	35
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	488160	333911	1390000	1	2.701	2.98	3.32

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for CARBAZOLE

Rosner's Outlier Test for 1 Outliers in CARBON DISULFIDE

Total N	65
Number NDs	38
Number Detects	27
Mean of Detects	32.34
SD of Detects	35.58
Number of data	27
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	32.34	34.92	100	3	1.938	2.86	3.18

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in CHROMIUM

Total N	62
Number NDs	0
Number Detects	62
Mean of Detects	4037
SD of Detects	1645
Number of data	62
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4037	1632	8030	36	2.447	3.212	3.572

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for CHRYSENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 2500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.836

For 10% significance level, 2500 is not an outlier.
For 5% significance level, 2500 is not an outlier.
For 1% significance level, 2500 is not an outlier.

2. Data Value 180 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.164

For 10% significance level, 180 is not an outlier.
For 5% significance level, 180 is not an outlier.
For 1% significance level, 180 is not an outlier.

Rosner's Outlier Test for 1 Outliers in COBALT

Total N	**61**
Number NDs	**9**
Number Detects	**52**
Mean of Detects	**299**
SD of Detects	**126.5**
Number of data	**52**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	299	125.3	620	16	2.561	3.144	3.496

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in COPPER

Total N	**66**
Number NDs	**0**
Number Detects	**66**
Mean of Detects	**2299**
SD of Detects	**973.7**

Number of data 66
Number of suspected outliers 1
NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2299	966.3	4850	39	2.64	3.236	3.596

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for DALAPON

No Outlier Test for DIBENZO(A,H)ANTHRACENE

No Outlier Test for DICHLORODIFLUOROMETHANE

Dixon's Outlier Test for ENDOSULFAN SULFATE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 13.6 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.817

For 10% significance level, 13.6 is not an outlier.
For 5% significance level, 13.6 is not an outlier.
For 1% significance level, 13.6 is not an outlier.

2. Data Value 2.42 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.183

For 10% significance level, 2.42 is not an outlier.
For 5% significance level, 2.42 is not an outlier.
For 1% significance level, 2.42 is not an outlier.

No Outlier Test for ENDRIN

No Outlier Test for ENDRIN ALDEHYDE

Dixon's Outlier Test for FLUORANTHENE

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941

1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 920 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.789

For 10% significance level, 920 is not an outlier.
For 5% significance level, 920 is not an outlier.
For 1% significance level, 920 is not an outlier.

2. Data Value 84 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.211

For 10% significance level, 84 is not an outlier.
For 5% significance level, 84 is not an outlier.
For 1% significance level, 84 is not an outlier.

No Outlier Test for GAMMA-CHLORDANE

No Outlier Test for HEPTACHLOR

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Rosner's Outlier Test for 1 Outliers in IRON

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**2103671**
SD of Detects	**1245371**
Number of data	**63**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	2103671	1235447	5820000	20	3.008	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in LEAD

Total N	**62**
Number NDs	**0**
Number Detects	**62**
Mean of Detects	**4190**
SD of Detects	**1973**
Number of data	**62**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	4190	1957	9600	10	2.764	3.212	3.572

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MAGNESIUM

Total N	63
Number NDs	0
Number Detects	63
Mean of Detects	138293
SD of Detects	77849
Number of data	63
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	138293	77229	357000	17	2.832	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MANGANESE

Total N	61
Number NDs	0
Number Detects	61
Mean of Detects	11610
SD of Detects	8116
Number of data	61
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	11610	8049	35700	15	2.993	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in MERCURY

Total N	65

Number NDs	28
Number Detects	37
Mean of Detects	194.5
SD of Detects	119.4
Number of data	37
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	194.5	117.8	540	17	2.934	3	3.34

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL ACETATE

Rosner's Outlier Test for 1 Outliers in NICKEL

Total N	65
Number NDs	4
Number Detects	61
Mean of Detects	1201
SD of Detects	665.8
Number of data	61
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	1201	660.4	3300	8	3.178	3.206	3.566

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in PERCENT SOLIDS

Total N	65
Number NDs	0
Number Detects	65
Mean of Detects	88.34
SD of Detects	4.017
Number of data	65
Number of suspected outliers	1

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	88.34	3.986	99	44	2.675	3.23	3.59

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

No Outlier Test for PHENANTHRENE

Rosner's Outlier Test for 1 Outliers in POTASSIUM

Total N	**60**
Number NDs	**3**
Number Detects	**57**
Mean of Detects	**68711**
SD of Detects	**29358**
Number of data	**57**
Number of suspected outliers	**1**

NDs not included in the following:

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	68711	29100	149000	19	2.759	3.179	3.536

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Dixon's Outlier Test for PYRENE

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 3500 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.745

For 10% significance level, 3500 is not an outlier.
For 5% significance level, 3500 is not an outlier.
For 1% significance level, 3500 is not an outlier.

2. Data Value 280 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.255

For 10% significance level, 280 is not an outlier.
For 5% significance level, 280 is not an outlier.
For 1% significance level, 280 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 66
Number NDs = 45
Number Detects = 21
10% critical value: 0.391
5% critical value: 0.44
1% critical value: 0.524
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.331

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 150 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.047

For 10% significance level, 150 is not an outlier.
For 5% significance level, 150 is not an outlier.
For 1% significance level, 150 is not an outlier.

Dixon's Outlier Test for SILVER

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 986 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.215

For 10% significance level, 986 is not an outlier.
For 5% significance level, 986 is not an outlier.
For 1% significance level, 986 is not an outlier.

2. Data Value 140 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.785

For 10% significance level, 140 is not an outlier.
For 5% significance level, 140 is not an outlier.
For 1% significance level, 140 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 64
Number NDs = 49

Number Detects = 15
10% critical value: 0.472
5% critical value: 0.525
1% critical value: 0.616
Note: NDs excluded from Outlier Test

1. Data Value 121000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.432

For 10% significance level, 121000 is not an outlier.
For 5% significance level, 121000 is not an outlier.
For 1% significance level, 121000 is not an outlier.

2. Data Value 40000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.055

For 10% significance level, 40000 is not an outlier.
For 5% significance level, 40000 is not an outlier.
For 1% significance level, 40000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for TOTAL DDD/DDE/DDT

Total N = 66
Number NDs = 60
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 12.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.042

For 10% significance level, 12.5 is not an outlier.
For 5% significance level, 12.5 is not an outlier.
For 1% significance level, 12.5 is not an outlier.

2. Data Value 2.93 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.115

For 10% significance level, 2.93 is not an outlier.
For 5% significance level, 2.93 is not an outlier.
For 1% significance level, 2.93 is not an outlier.

Dixon's Outlier Test for TOTAL_PAH*

Total N = 65
Number NDs = 62
Number Detects = 3

10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 4087 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.752

For 10% significance level, 4087 is not an outlier.
For 5% significance level, 4087 is not an outlier.
For 1% significance level, 4087 is not an outlier.

2. Data Value 142 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.248

For 10% significance level, 142 is not an outlier.
For 5% significance level, 142 is not an outlier.
For 1% significance level, 142 is not an outlier.

Dixon's Outlier Test for TRICHLOROFLUOROMETHANE

Total N = 66
Number NDs = 61
Number Detects = 5
10% critical value: 0.557
5% critical value: 0.642
1% critical value: 0.78
Note: NDs excluded from Outlier Test

1. Data Value 7 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.400

For 10% significance level, 7 is not an outlier.
For 5% significance level, 7 is not an outlier.
For 1% significance level, 7 is not an outlier.

2. Data Value 2 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.400

For 10% significance level, 2 is not an outlier.
For 5% significance level, 2 is not an outlier.
For 1% significance level, 2 is not an outlier.

Rosner's Outlier Test for 1 Outliers in VANADIUM

Total N	**63**
Number NDs	**0**
Number Detects	**63**
Mean of Detects	**5131**
SD of Detects	**2305**

Number of data	**63**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5131	2286	11500	20	2.786	3.218	3.578

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Rosner's Outlier Test for 1 Outliers in ZINC

Total N	**66**
Number NDs	**38**
Number Detects	**28**
Mean of Detects	**5621**
SD of Detects	**4425**
Number of data	**28**
Number of suspected outliers	**1**
NDs not included in the following:	

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	5621	4345	18000	10	2.849	2.88	3.2

For 5% Significance Level, there is no Potential Outlier

For 1% Significance Level, there is no Potential Outlier

Appendix B2
Soil Q-Q Plots

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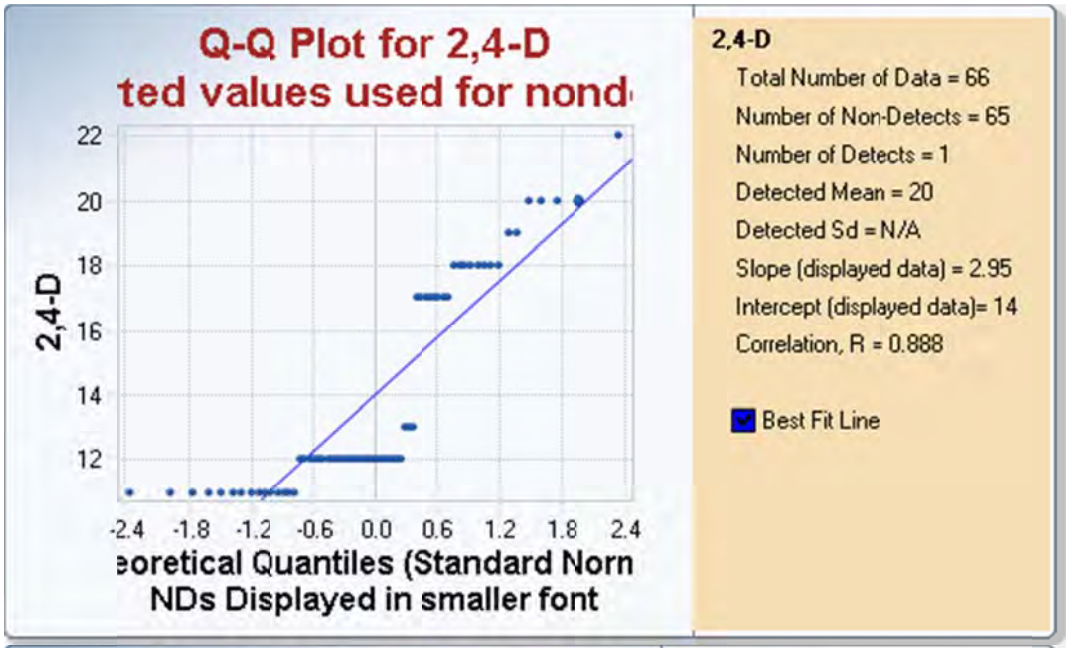
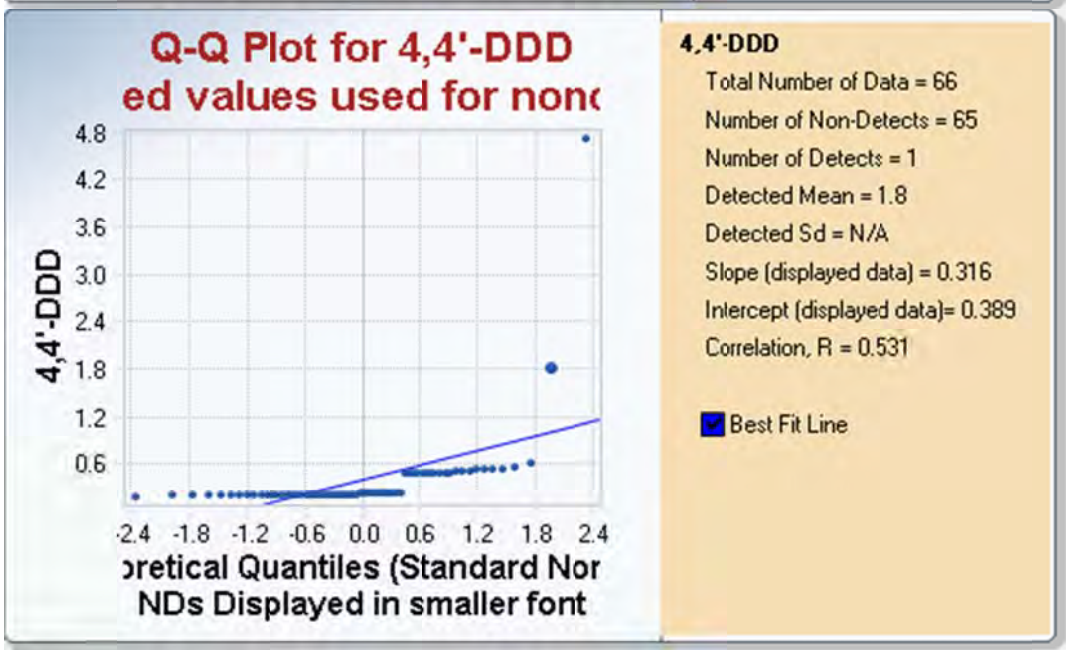
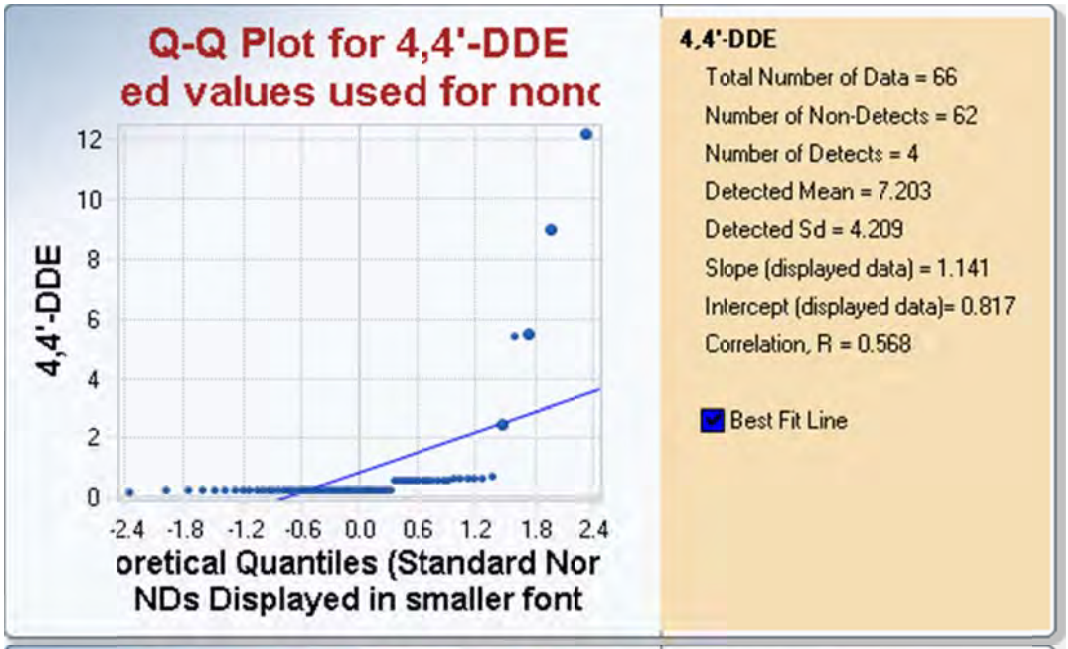
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

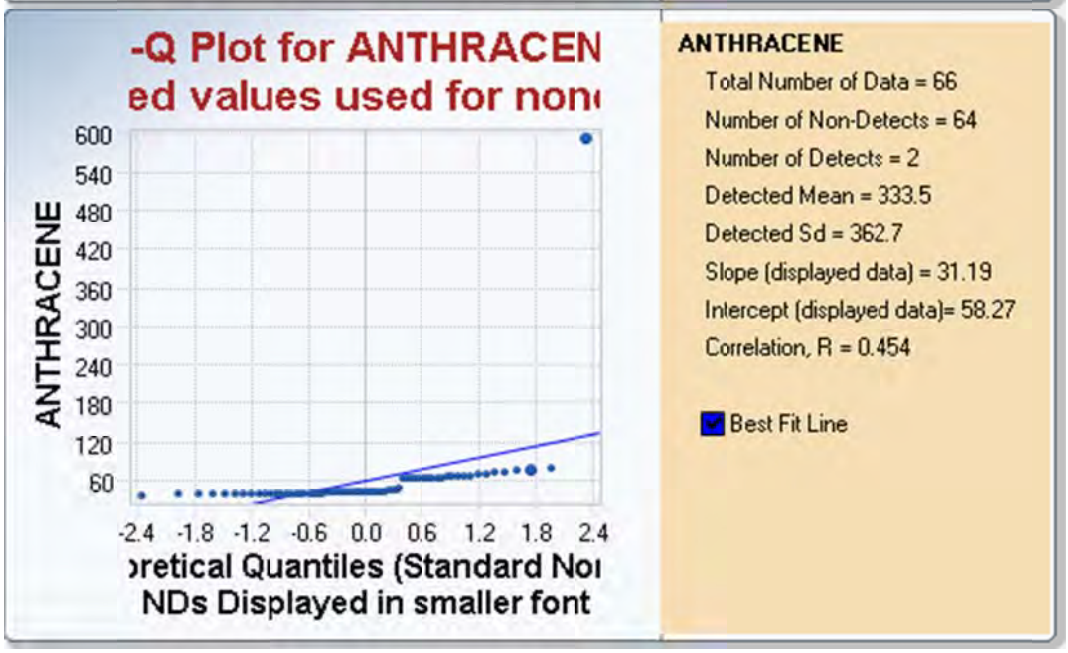
The following plots are for parameters that no outlier test could be performed by ProUCL:



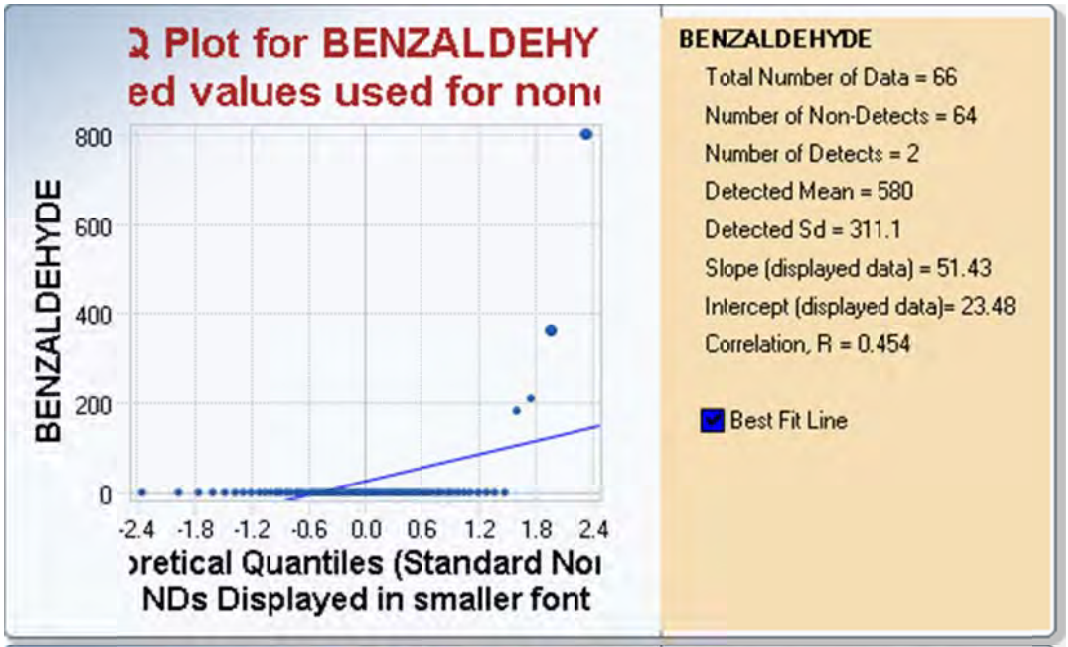


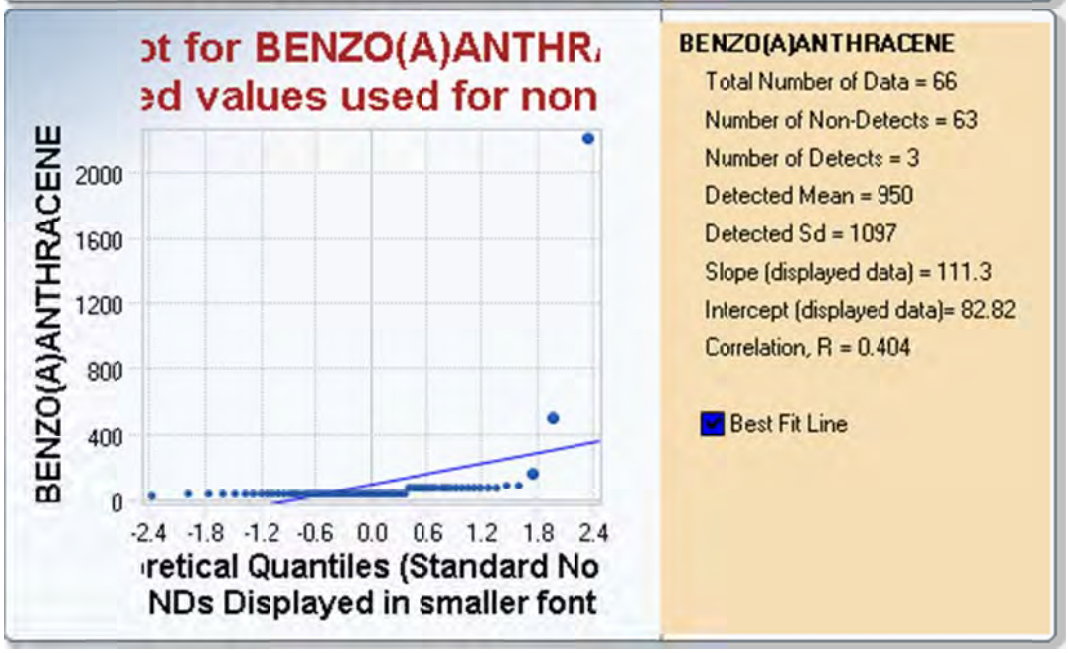
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



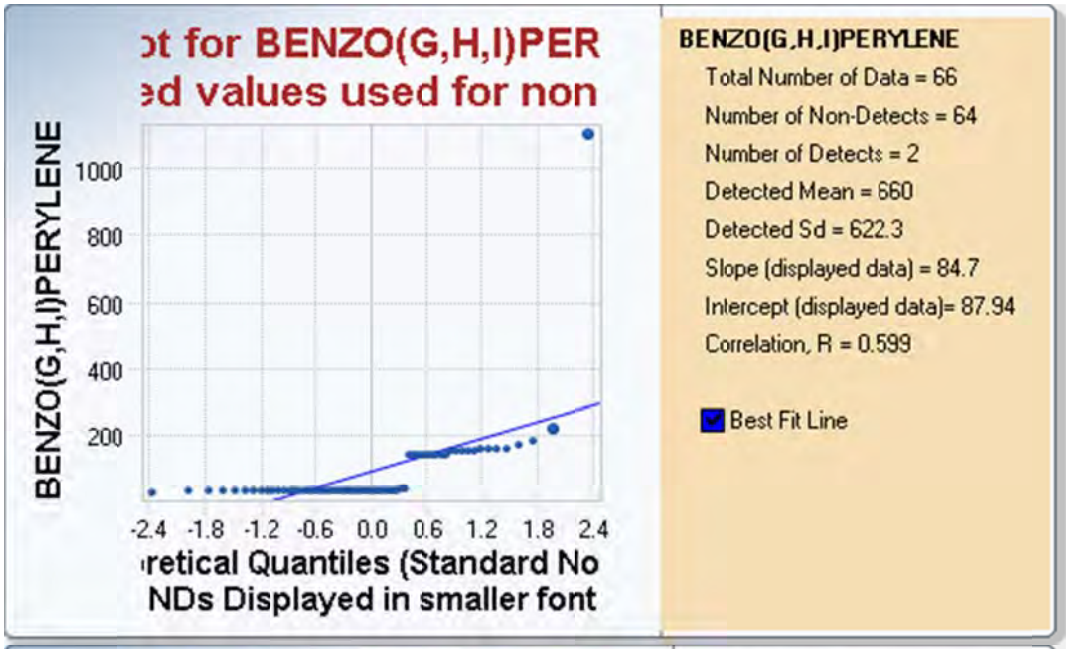


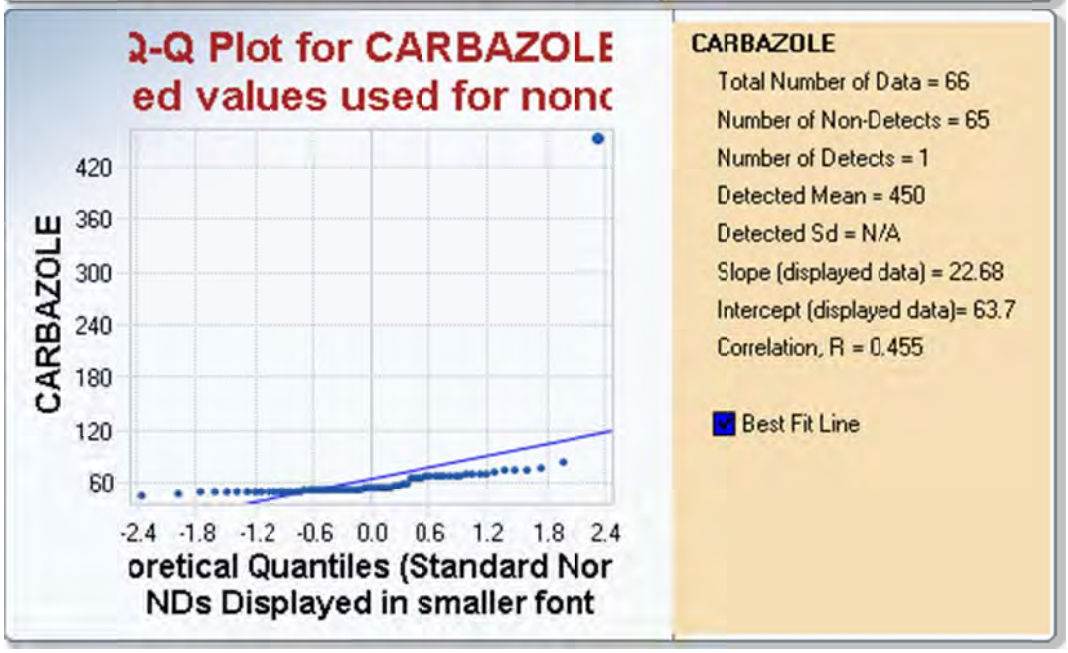
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



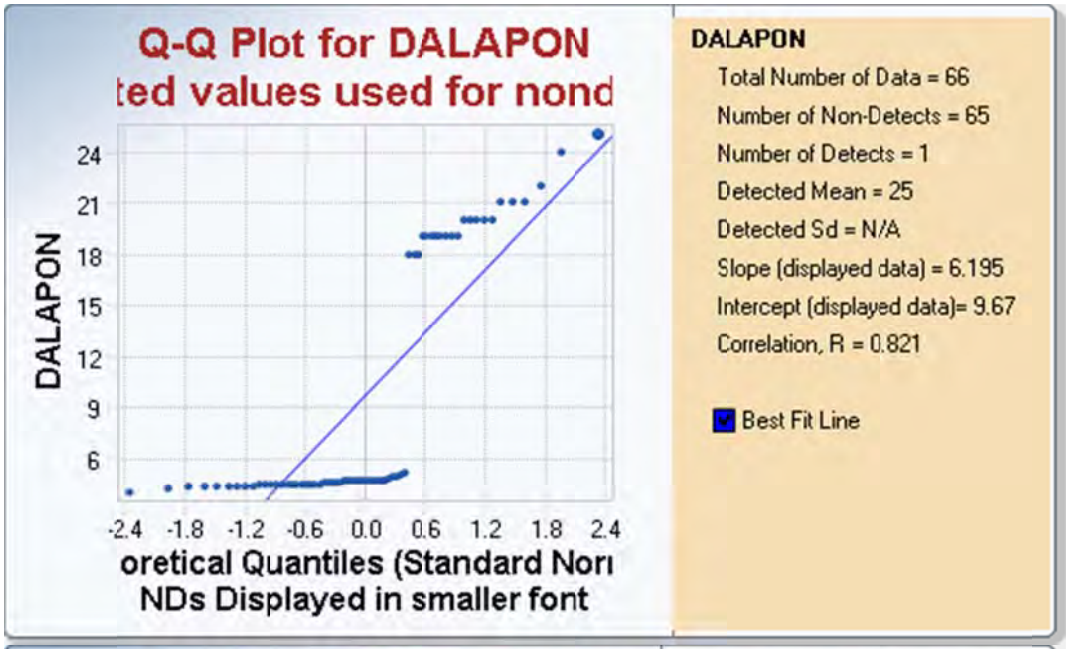


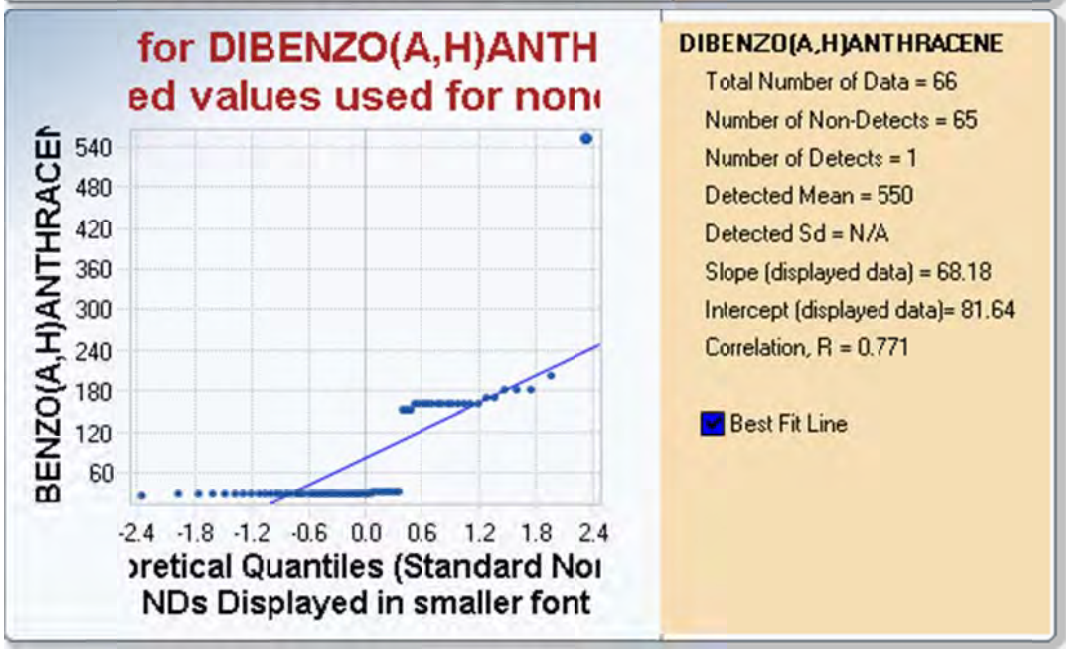
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



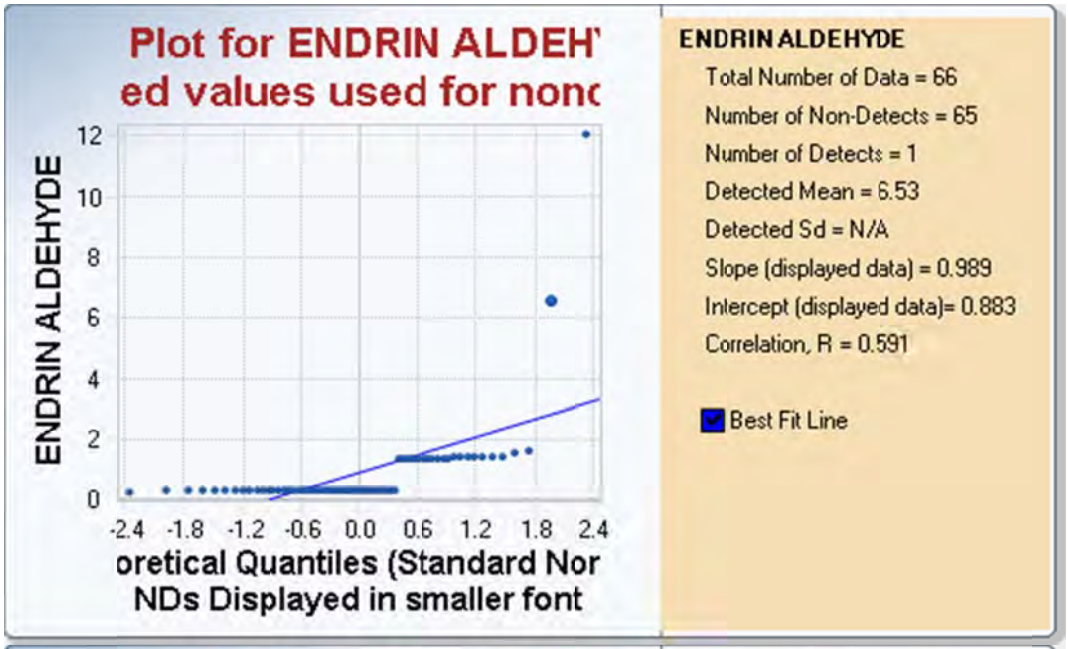


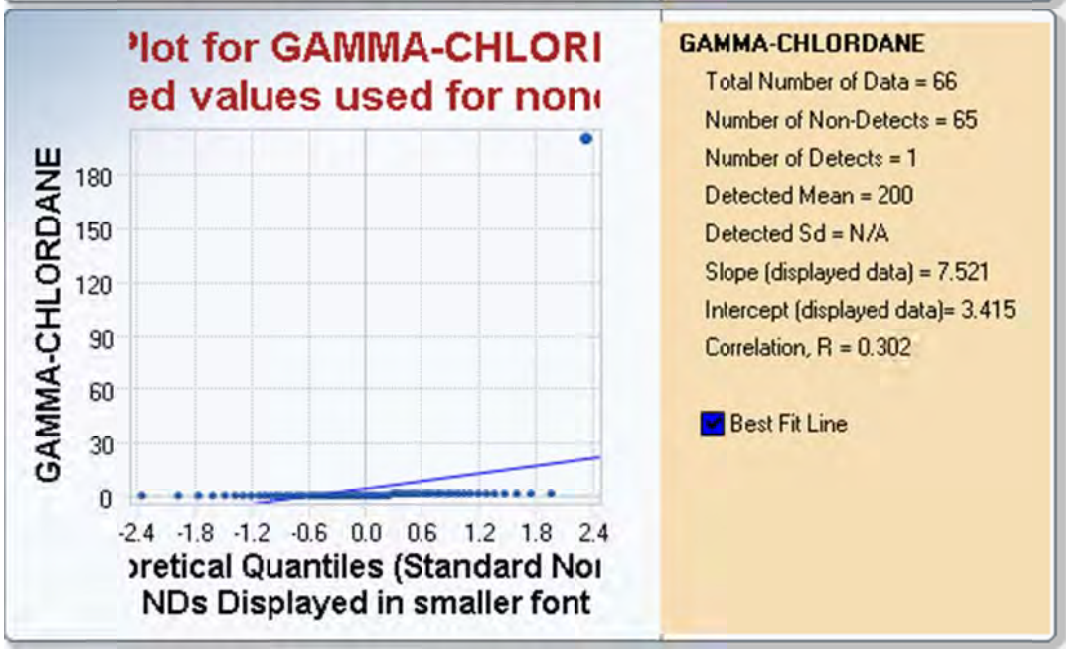
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



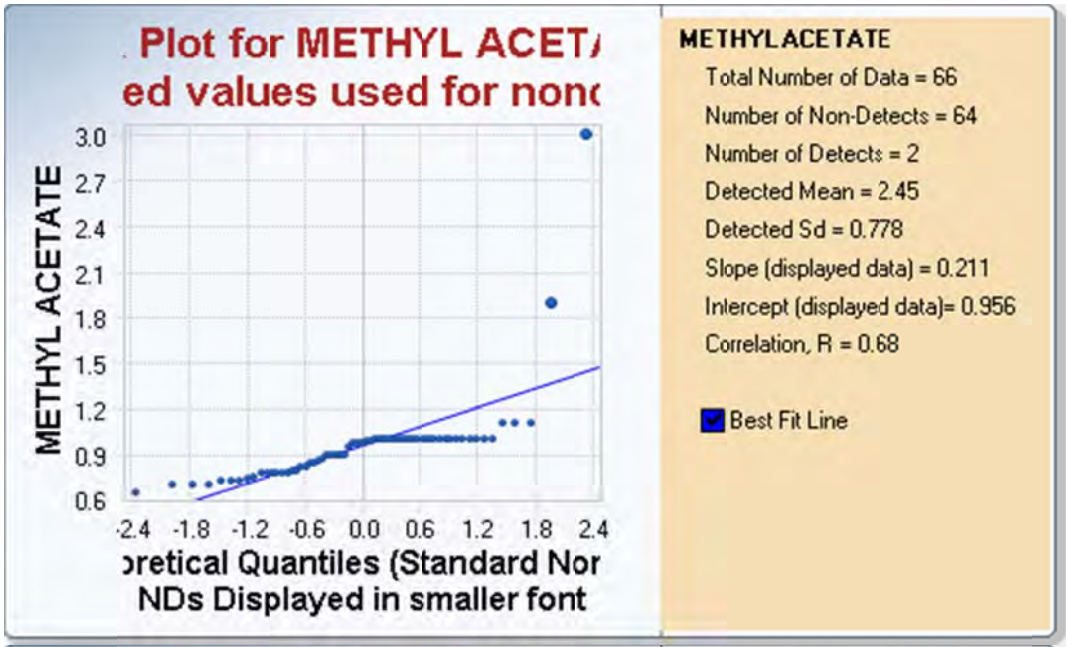


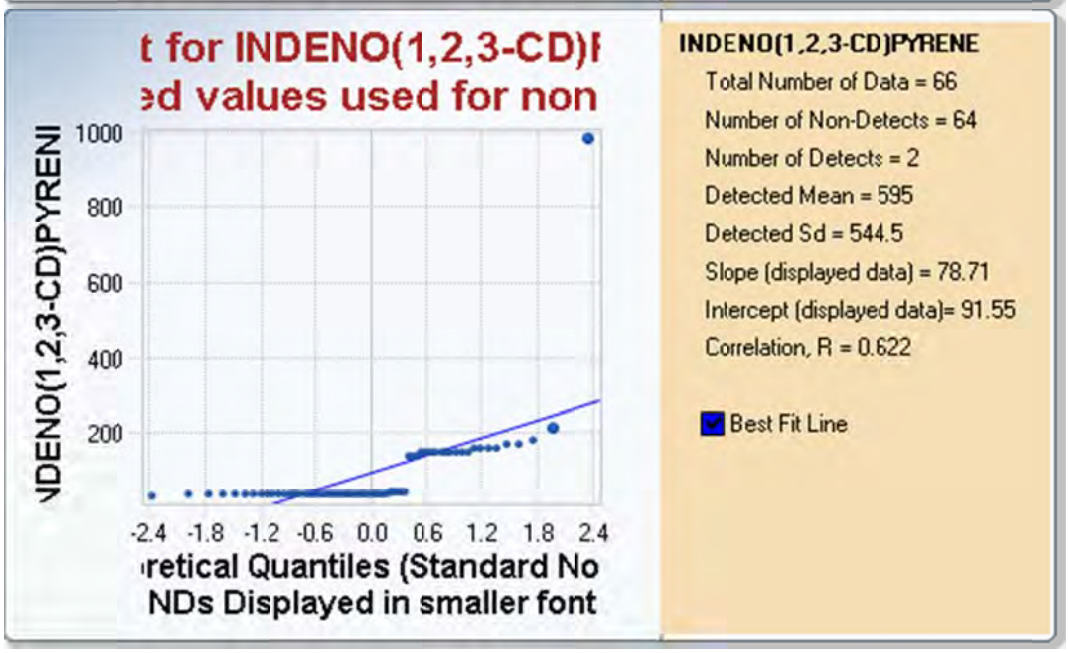
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



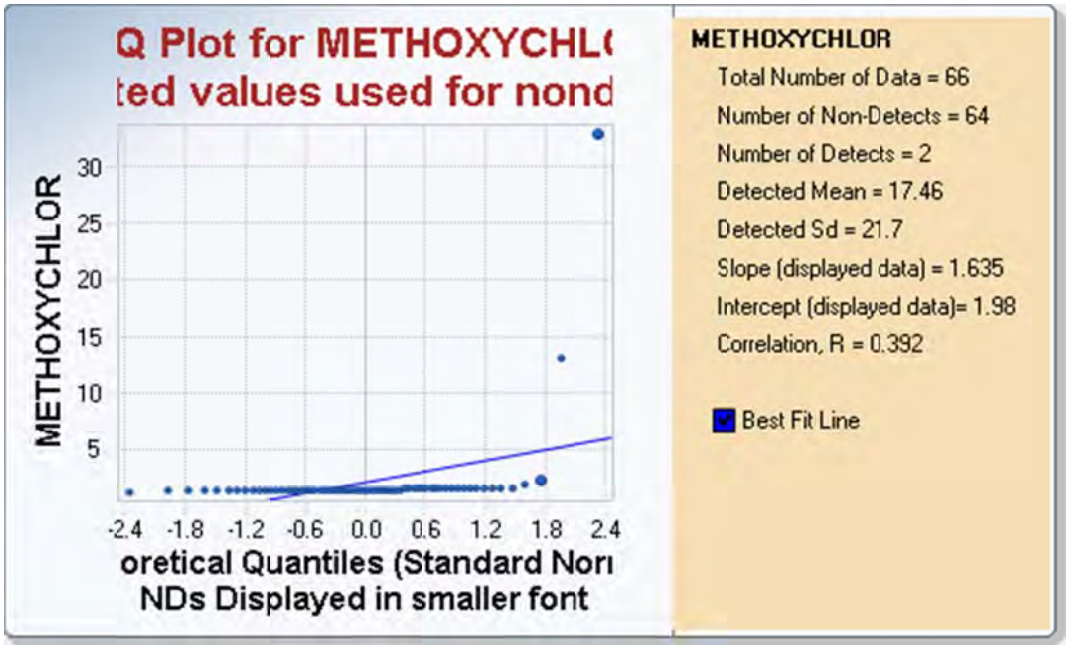


Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



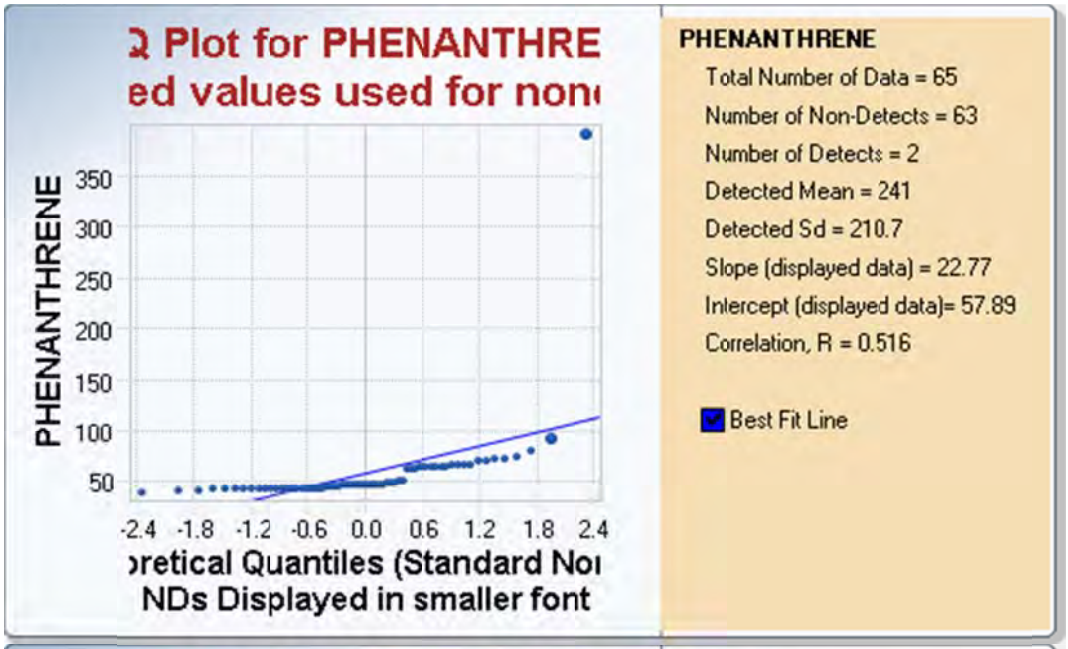


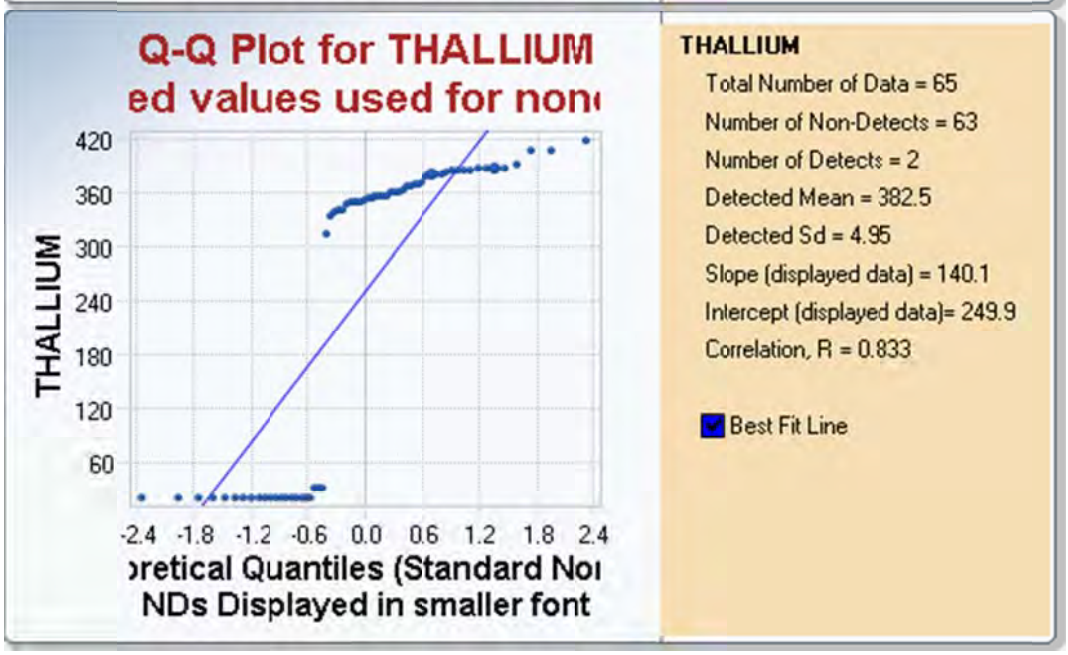
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

Phenanthrene and Thallium outlier test could not be performed following the second iteration.

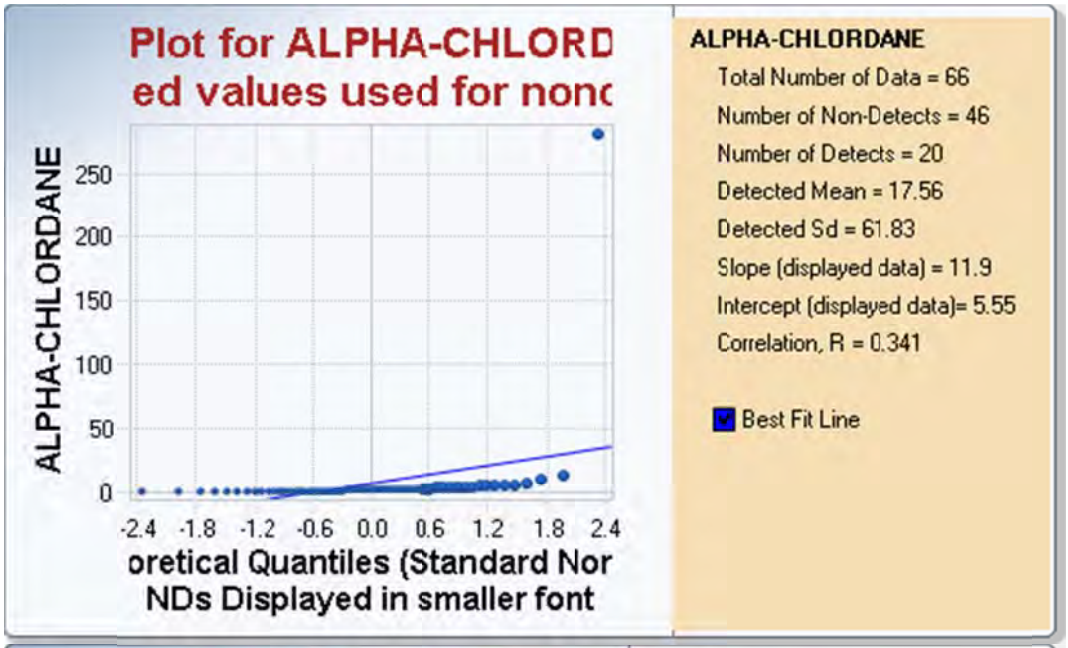


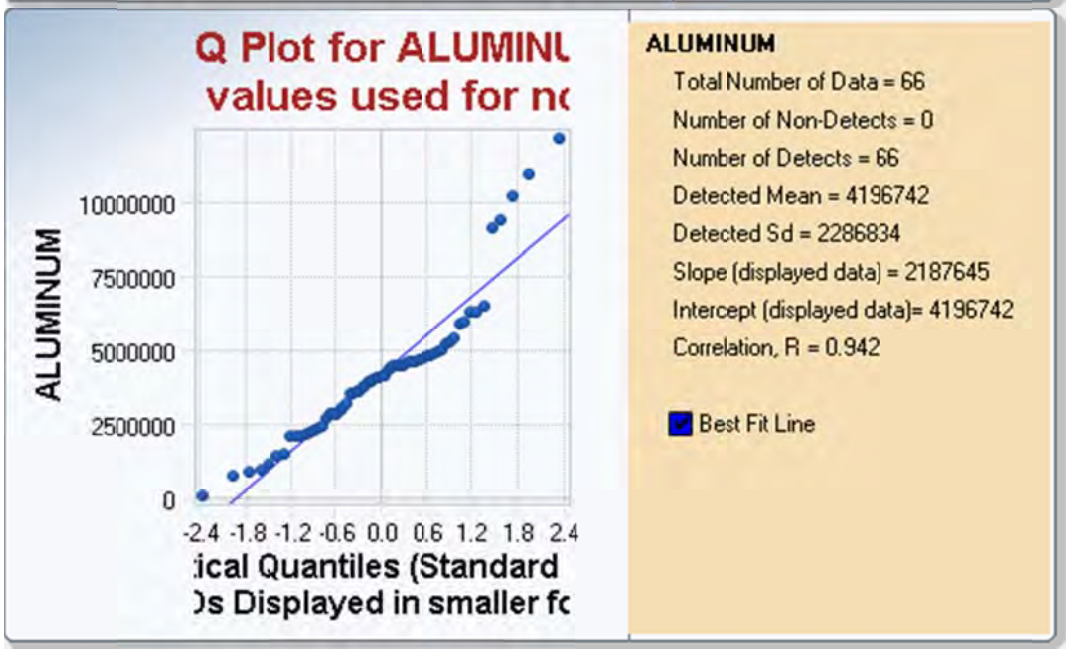


Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

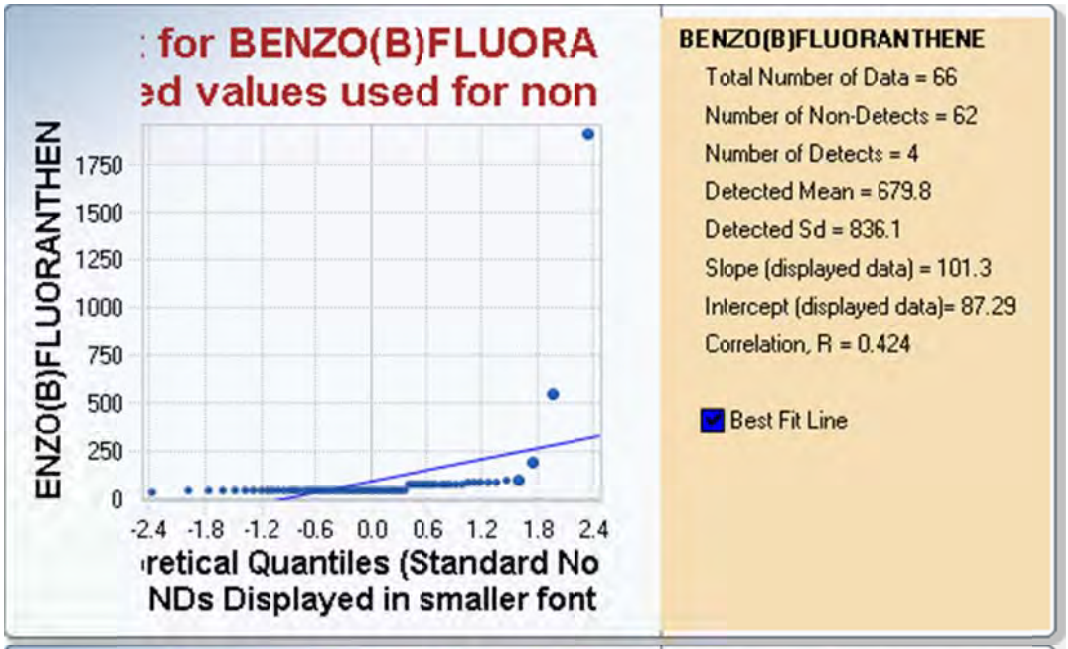
Outliers were detected in these analytes:

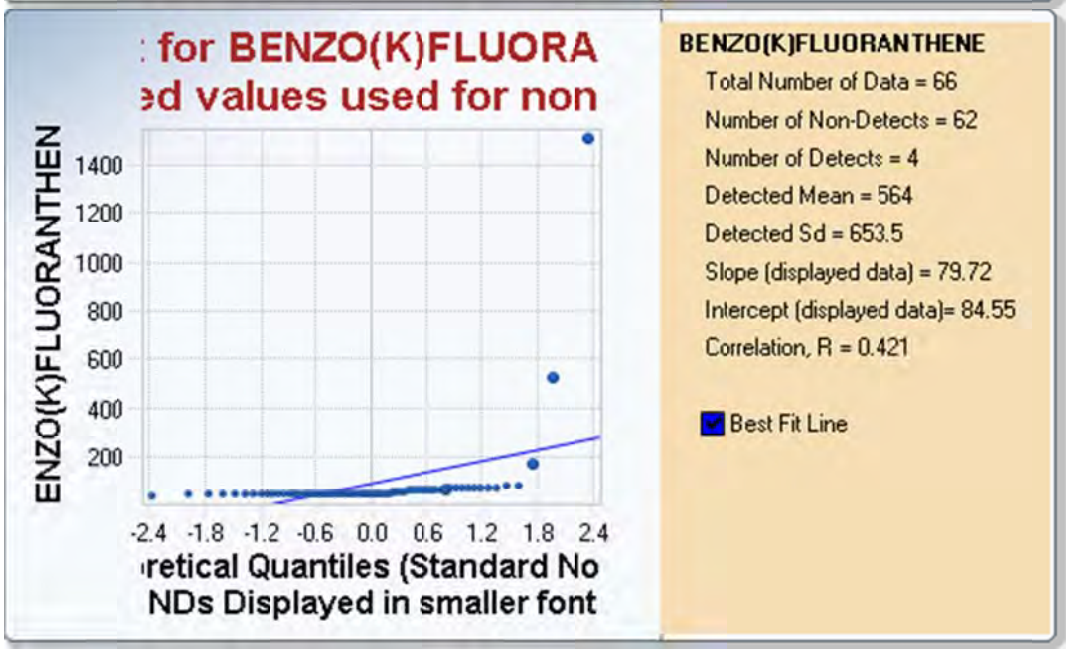
Iteration 1



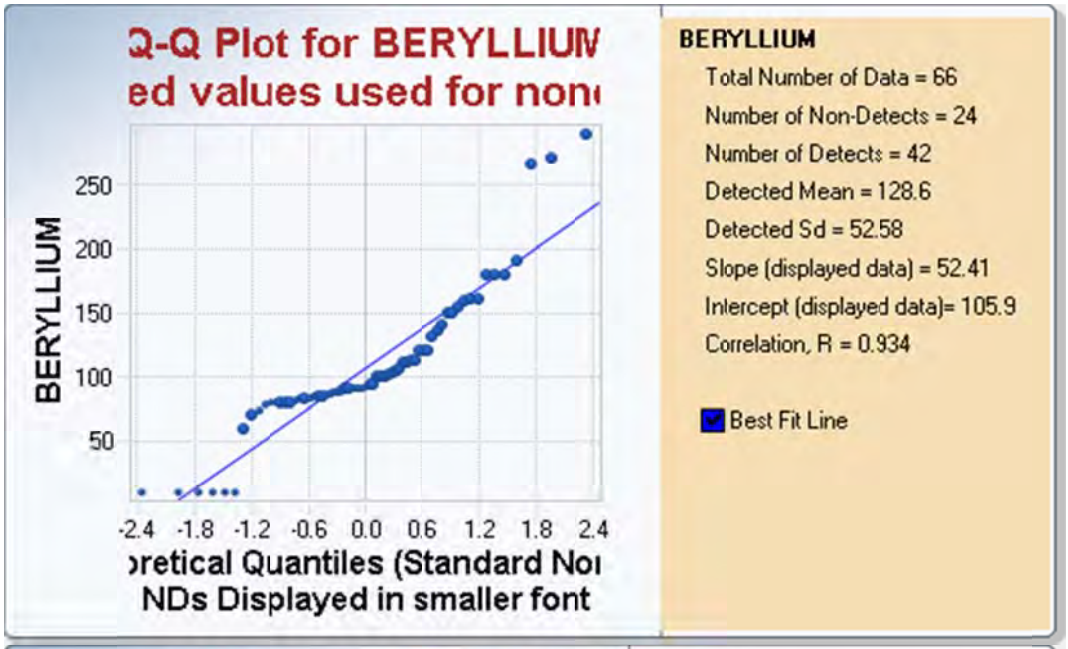


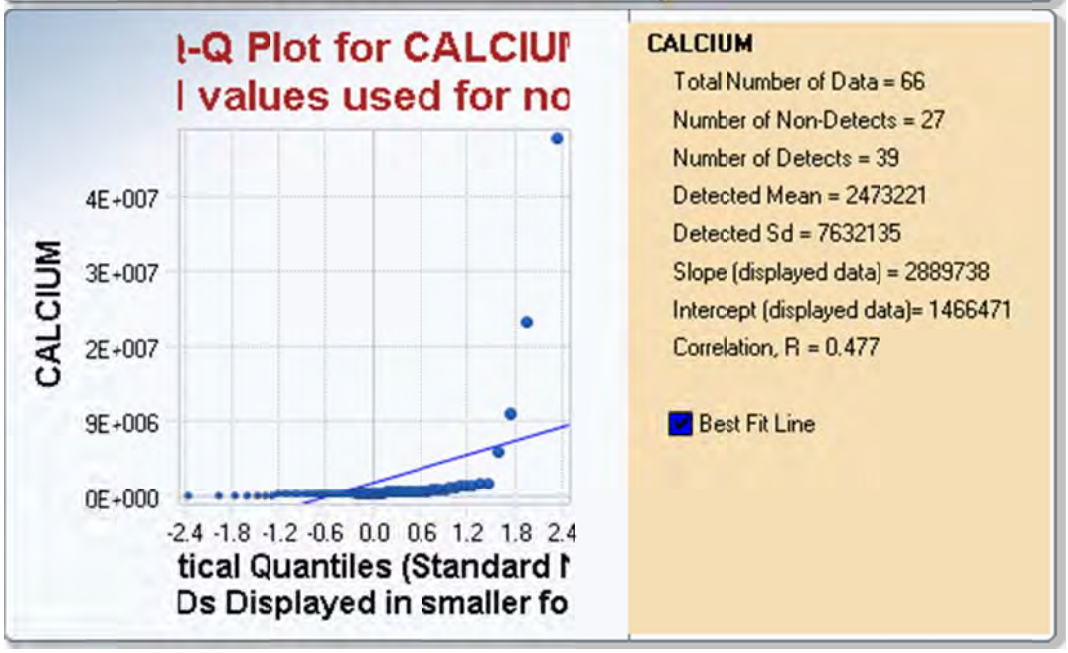
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



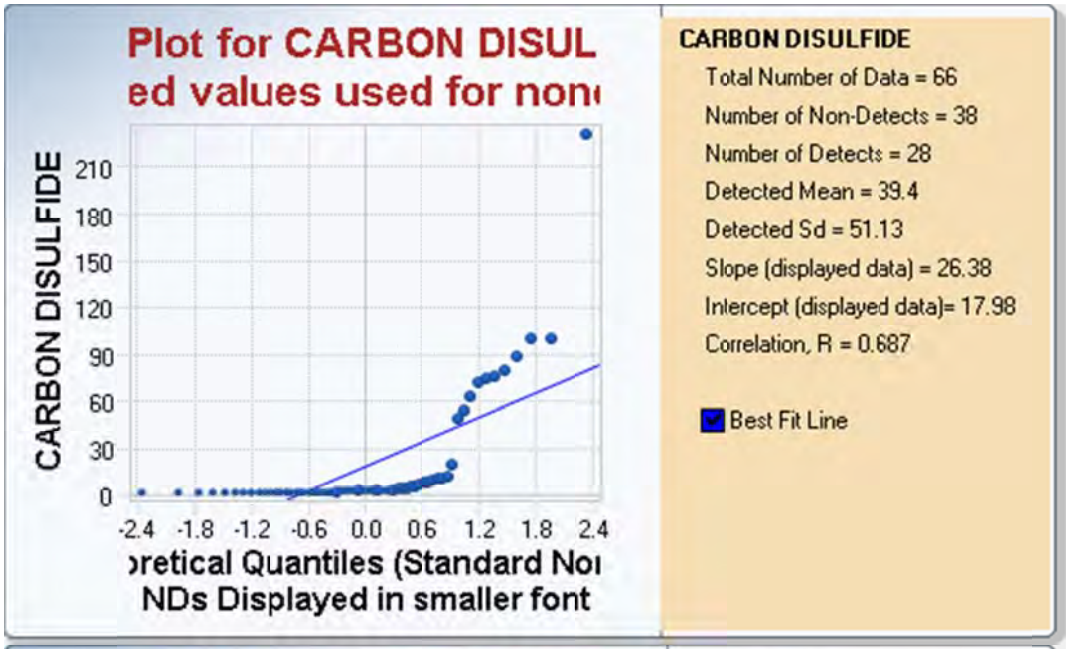


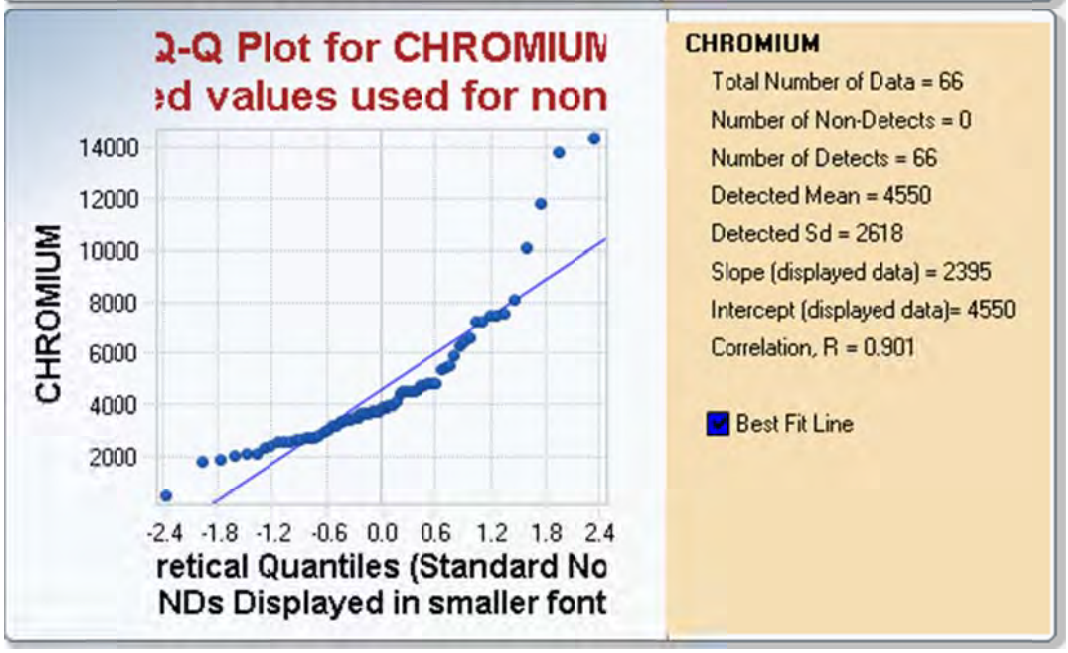
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



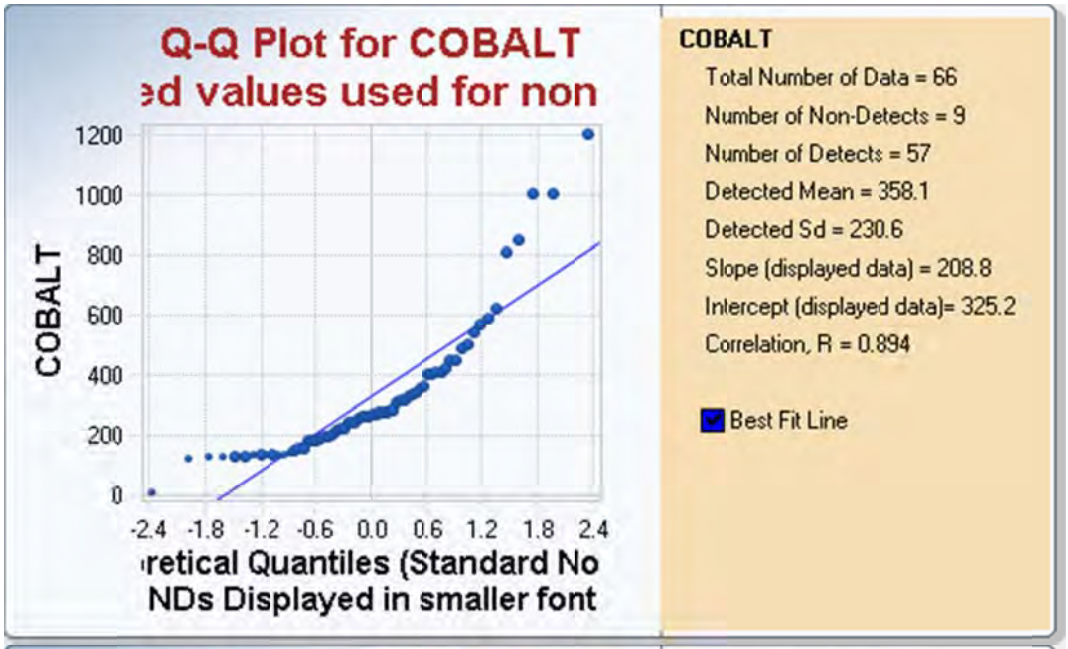


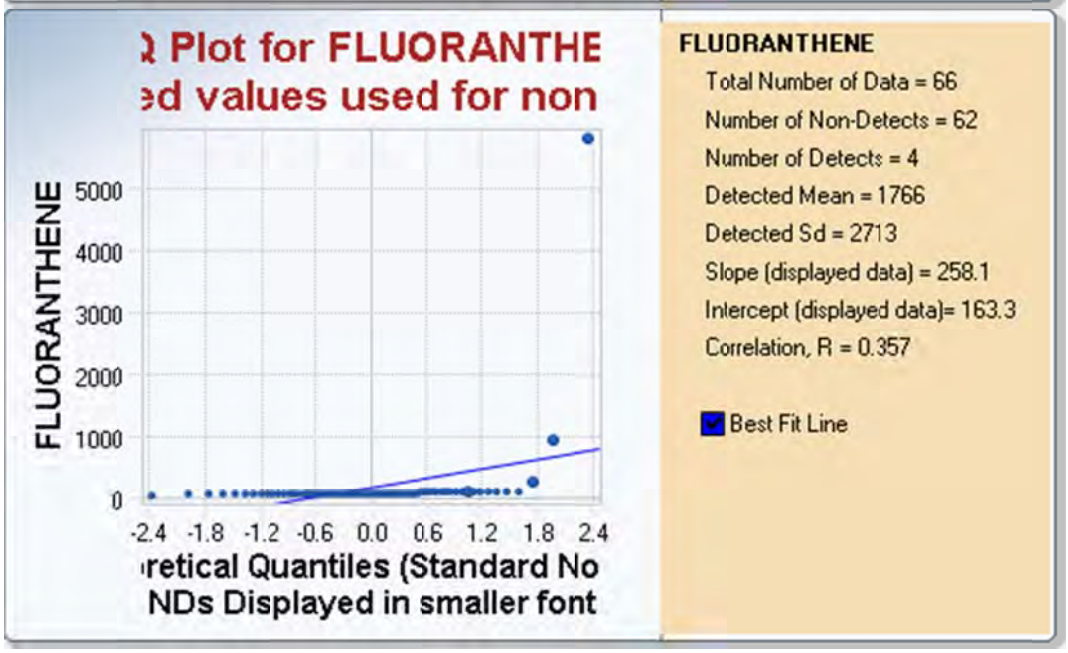
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



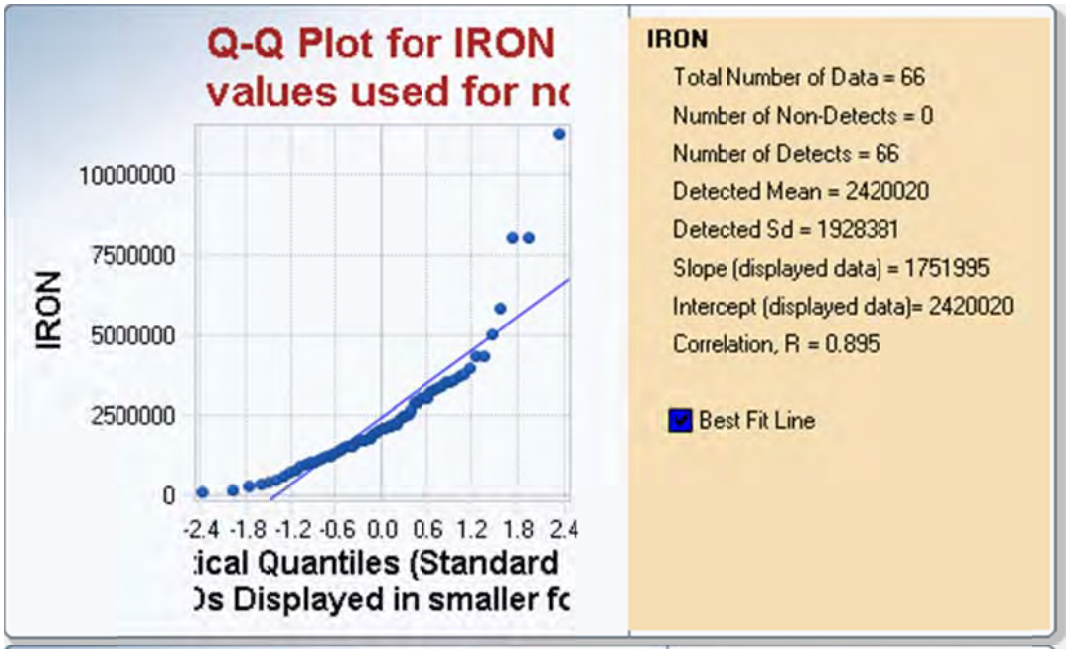


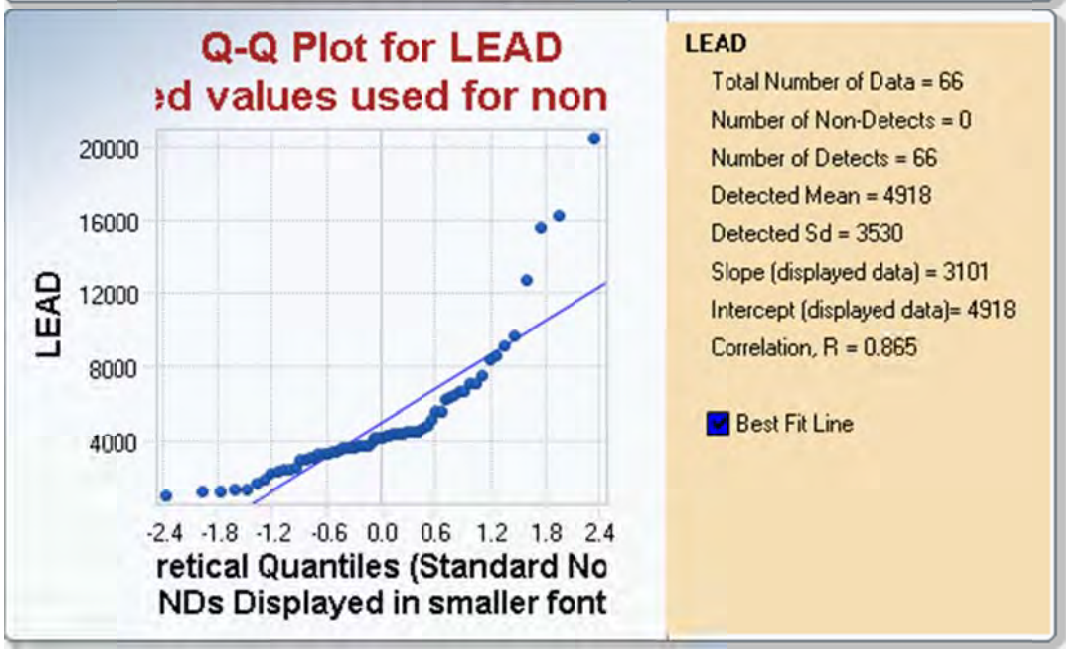
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



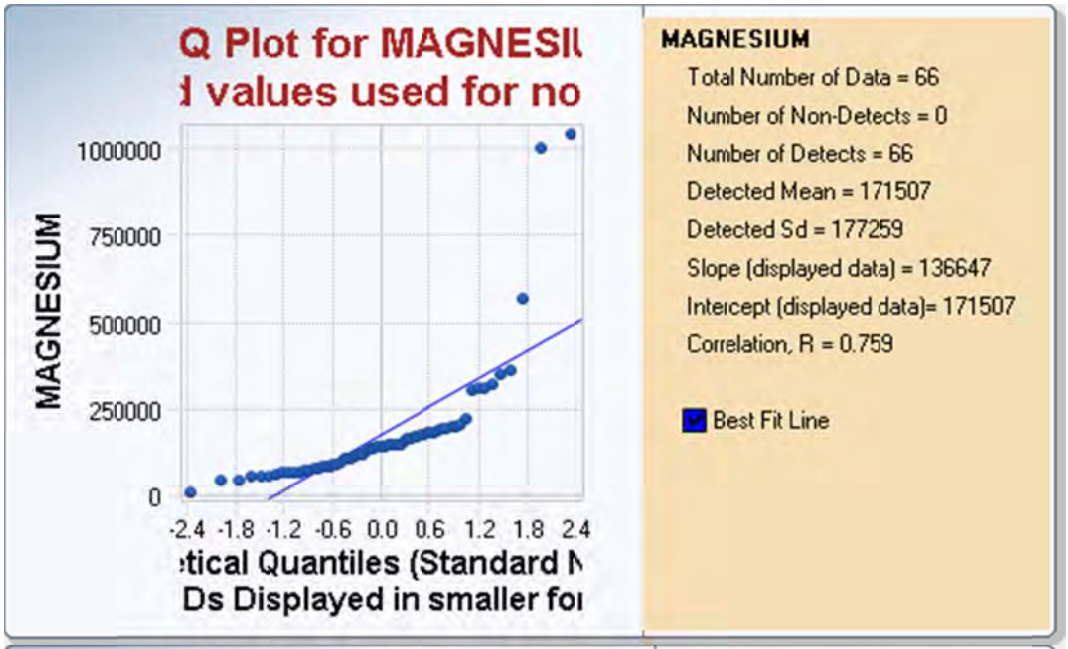


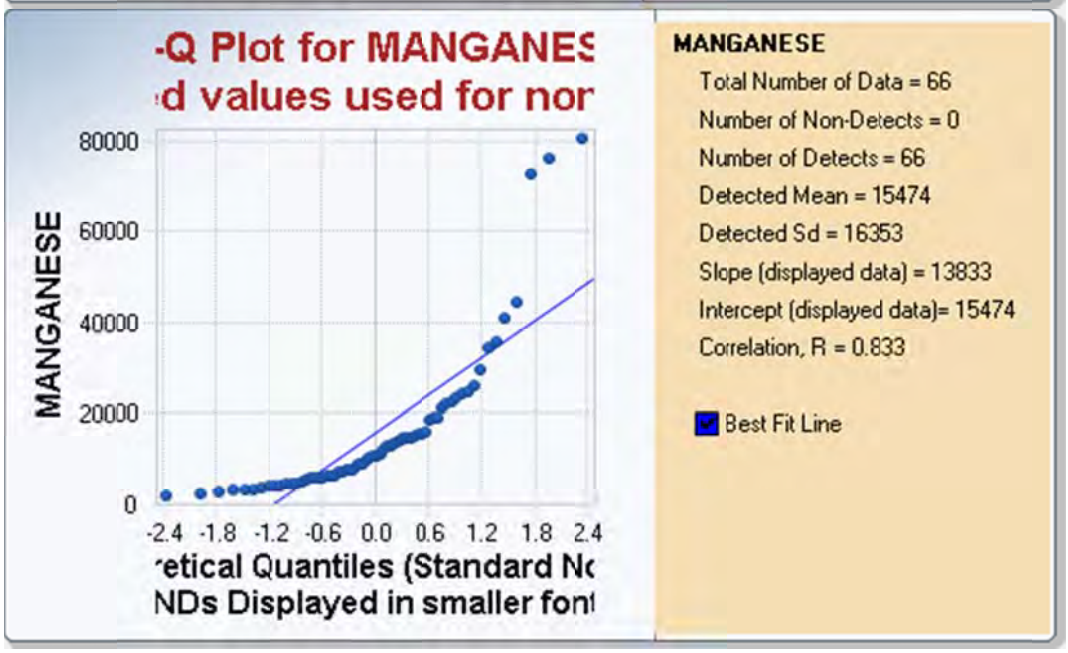
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



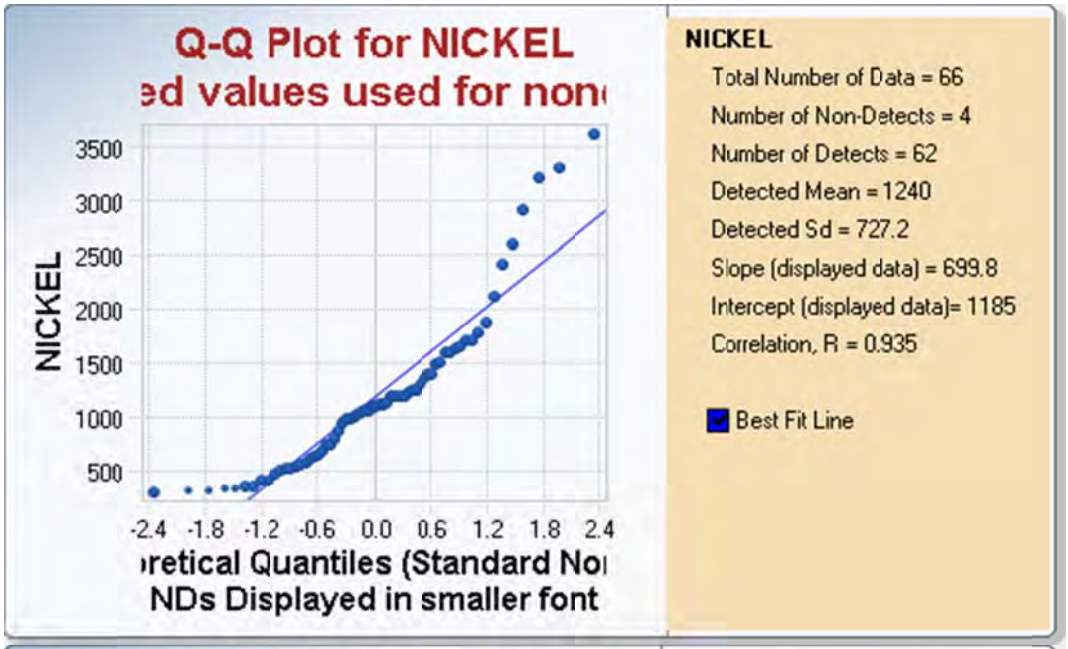


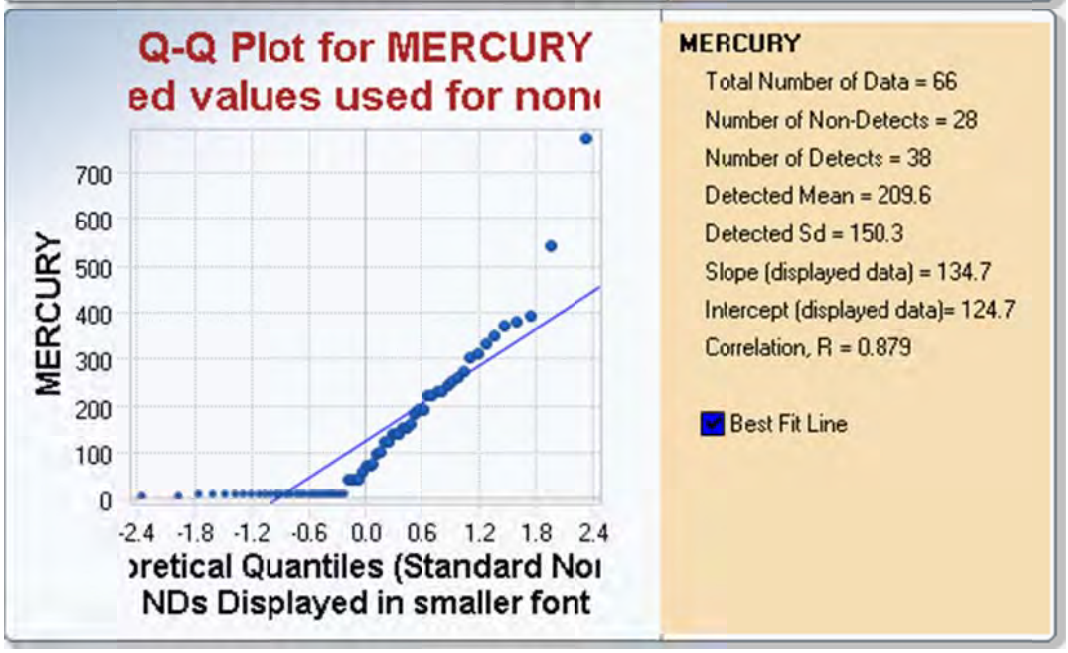
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





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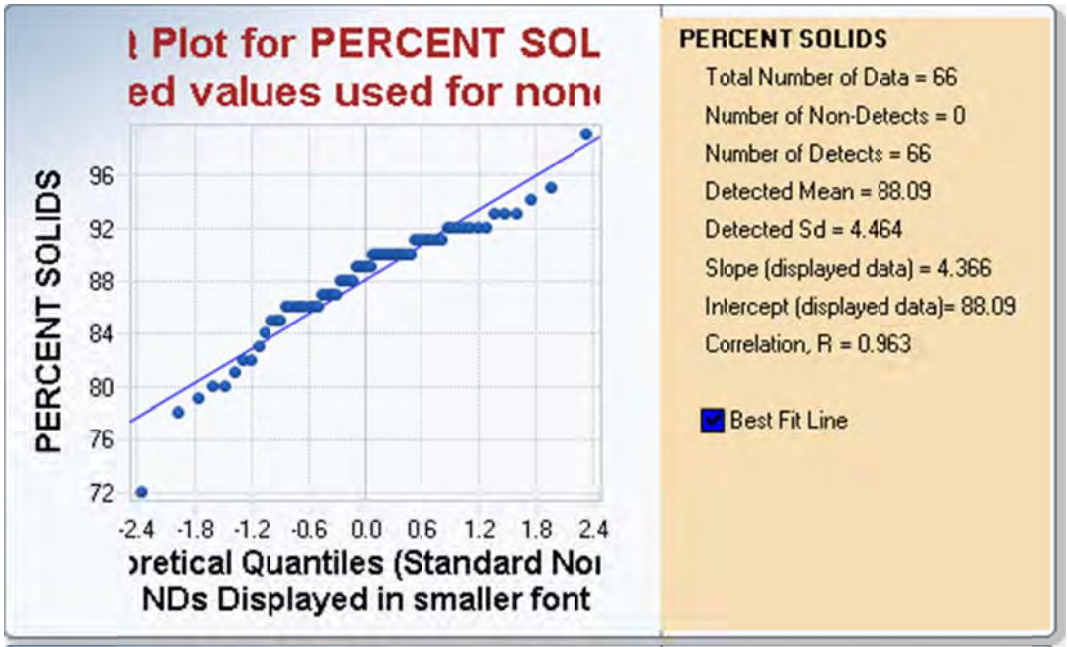

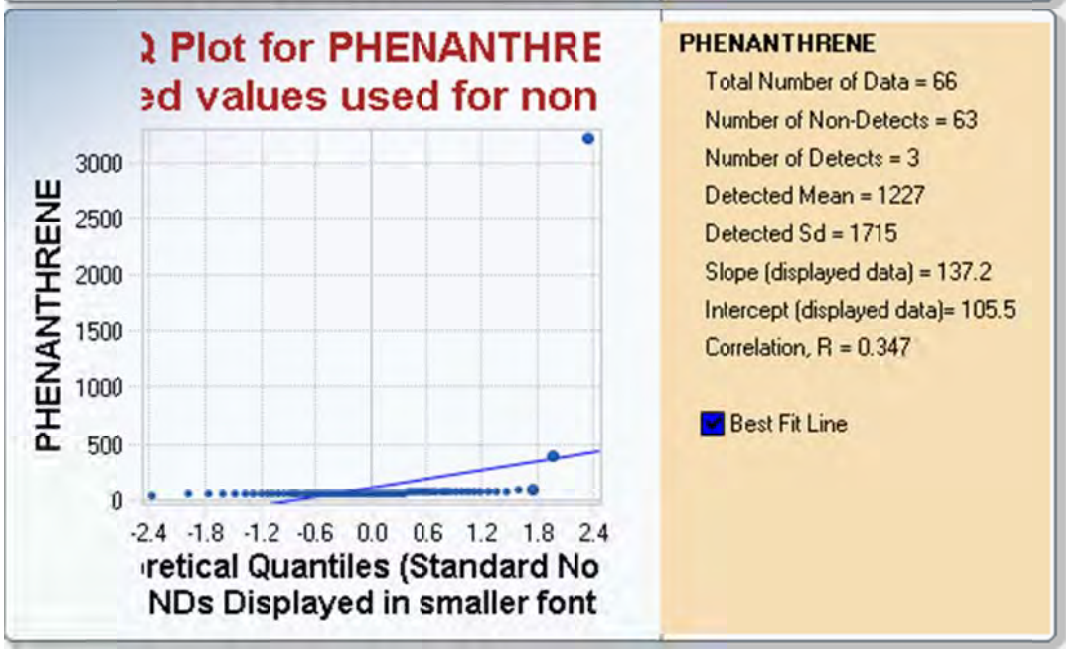

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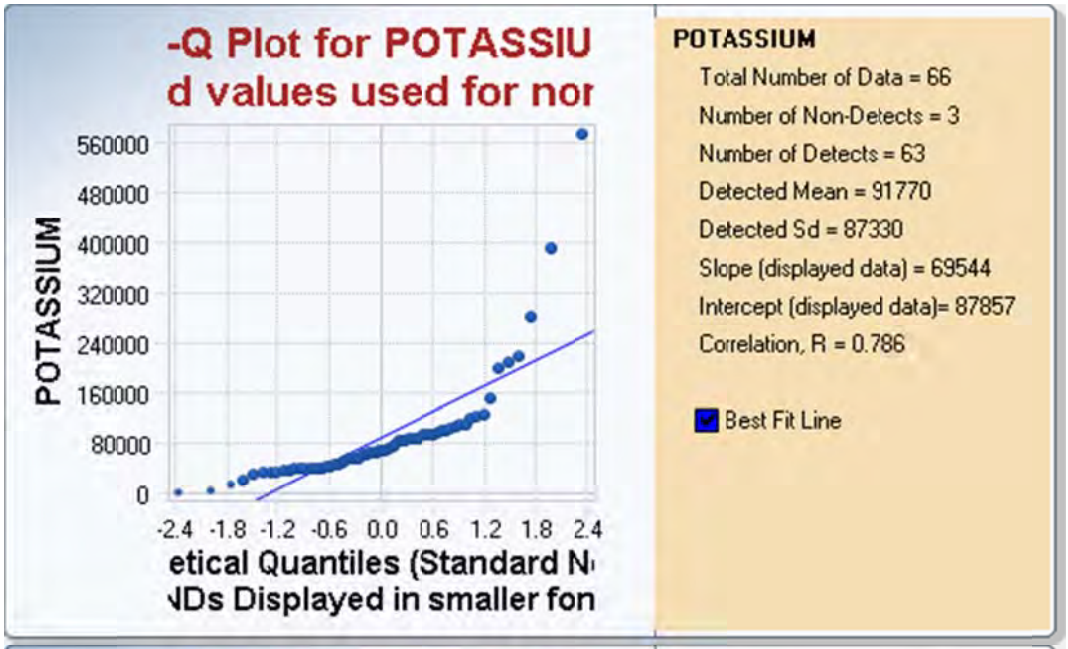

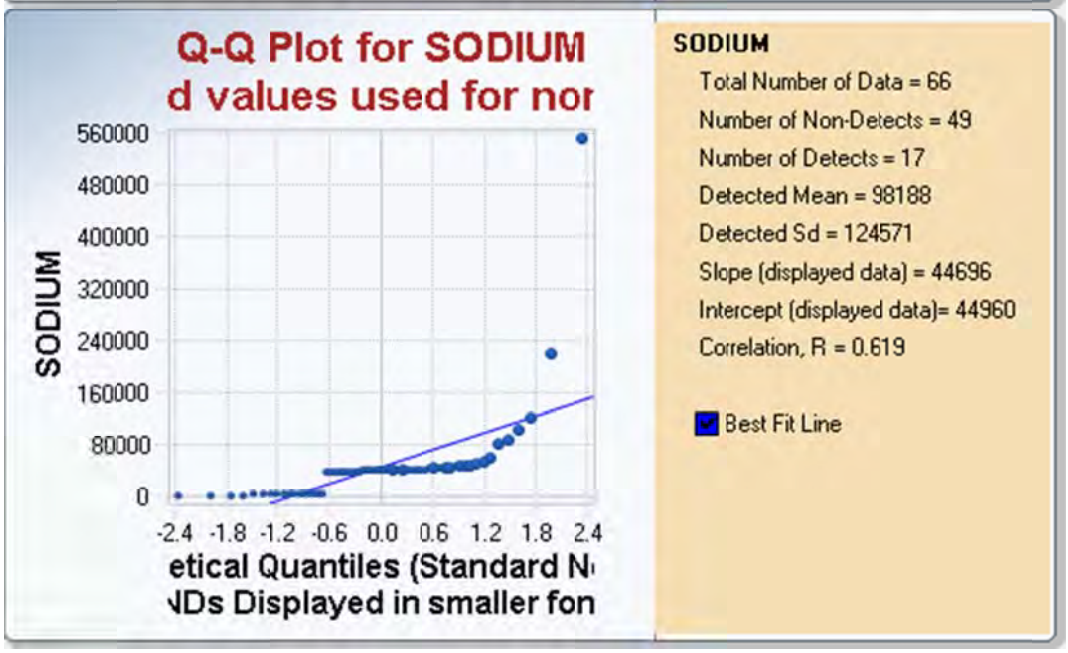

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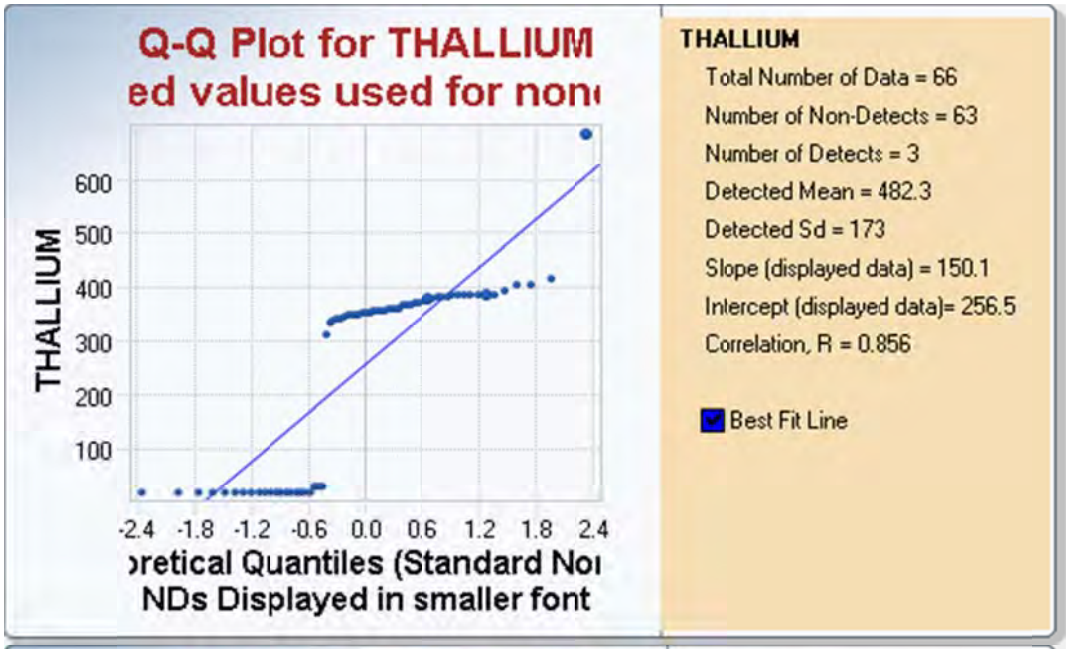
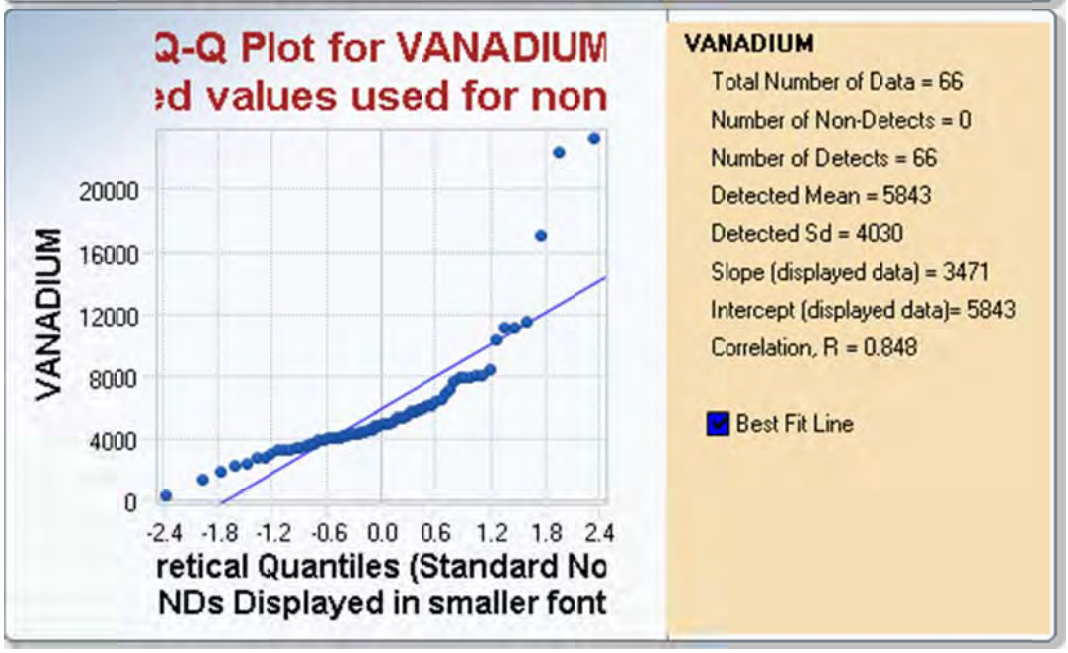
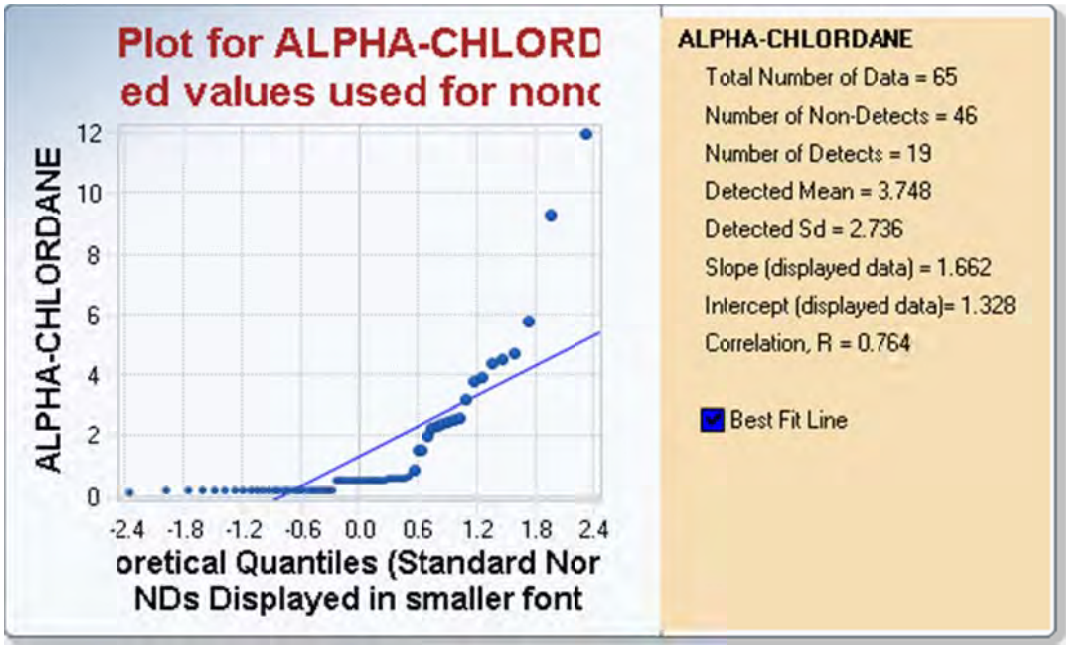
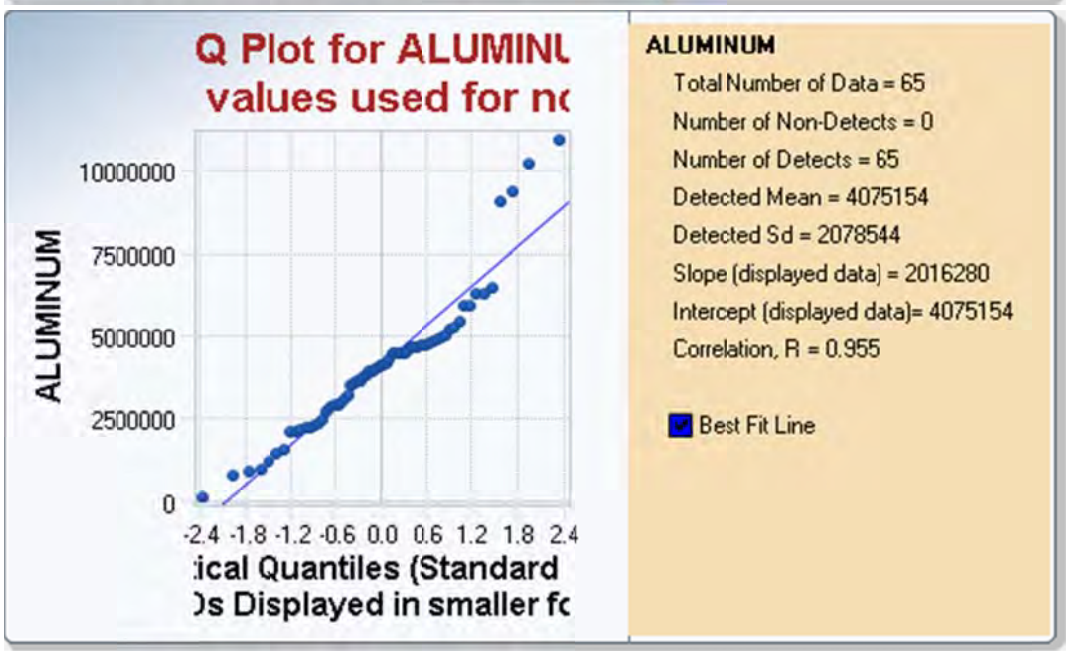




Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

Iteration 2





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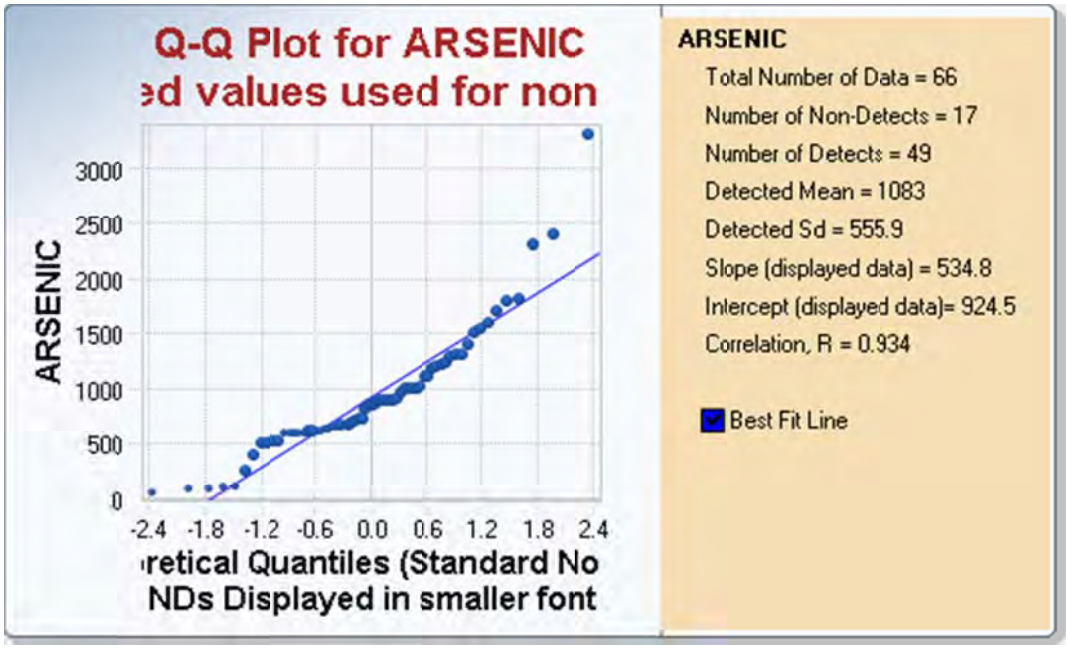

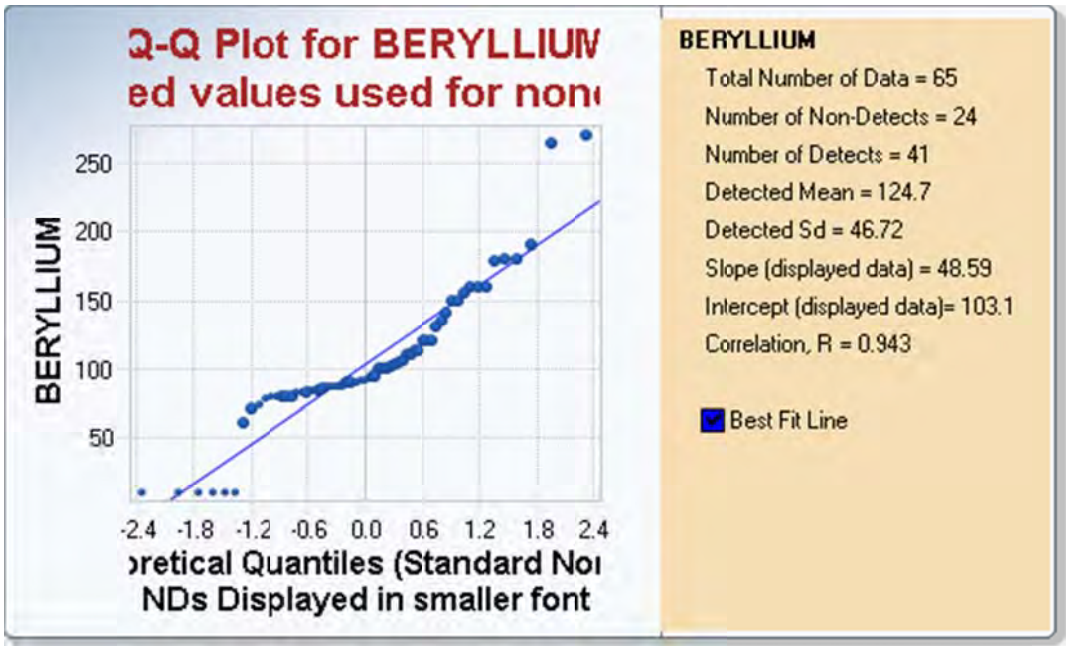

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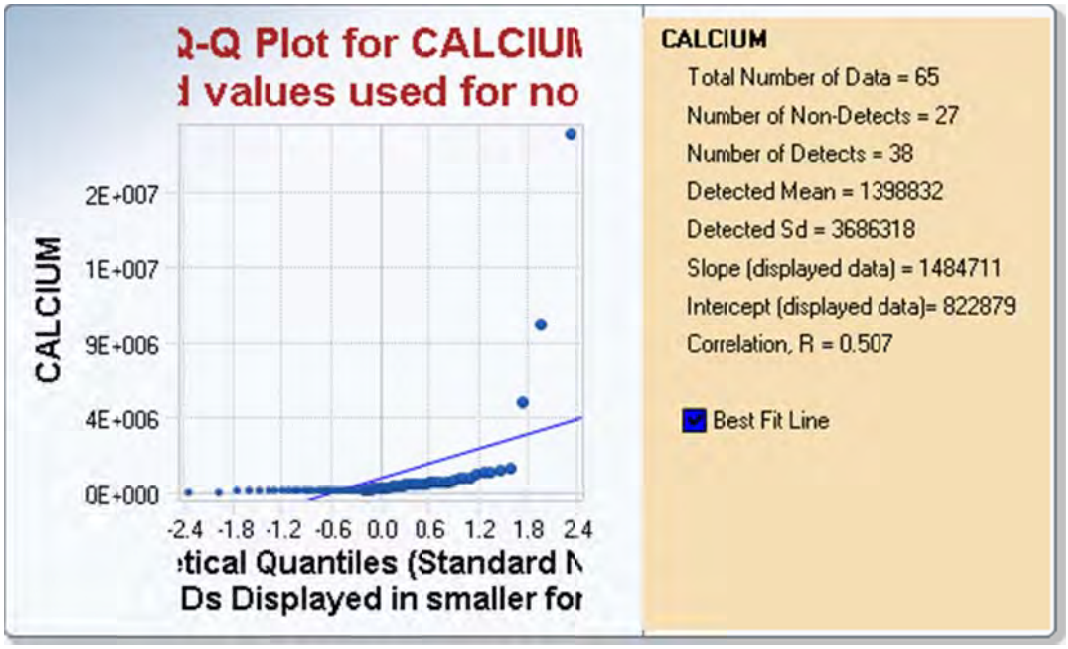
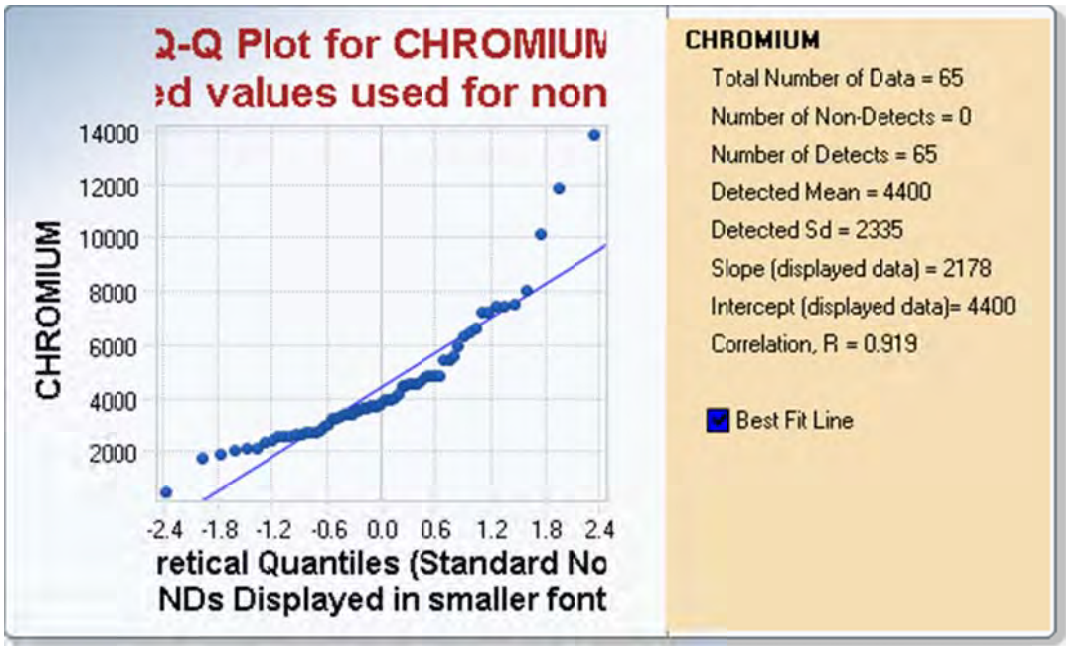
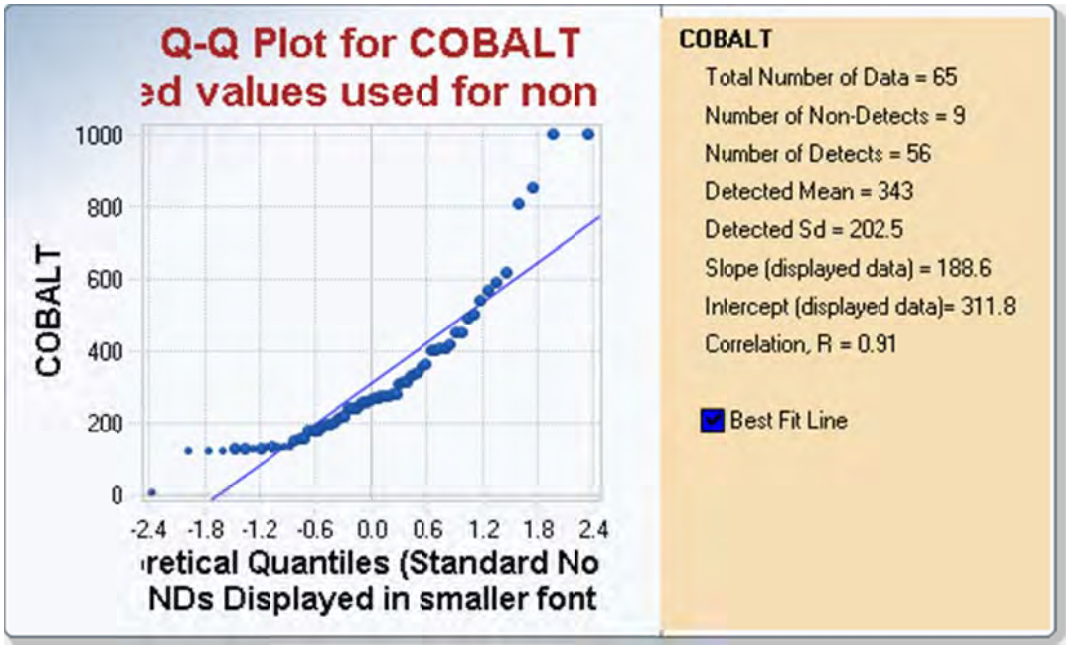
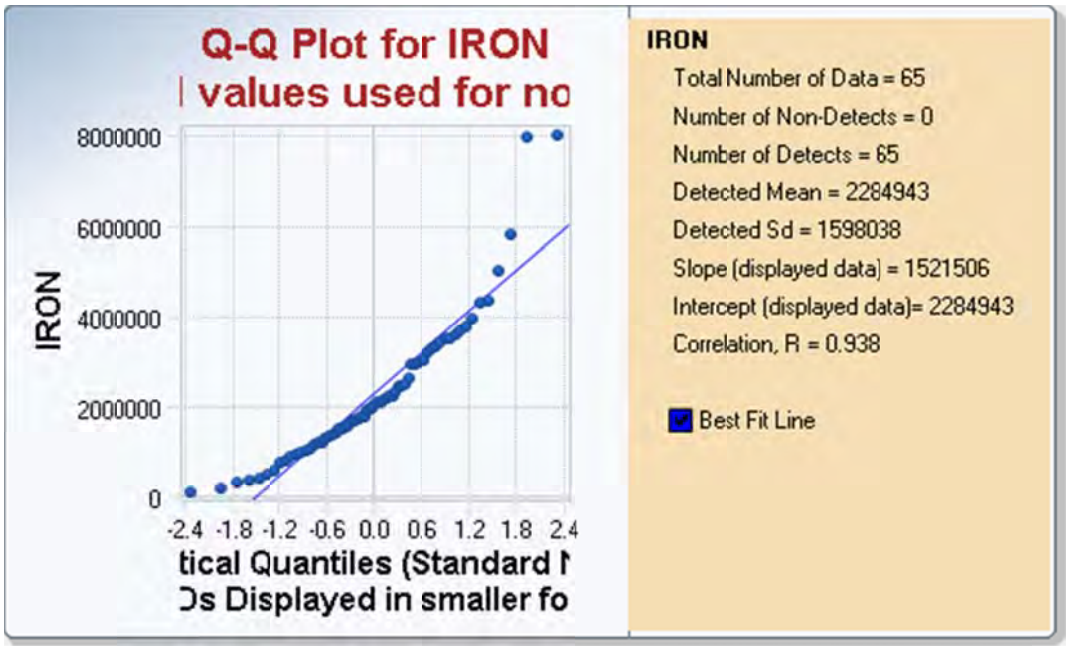




Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





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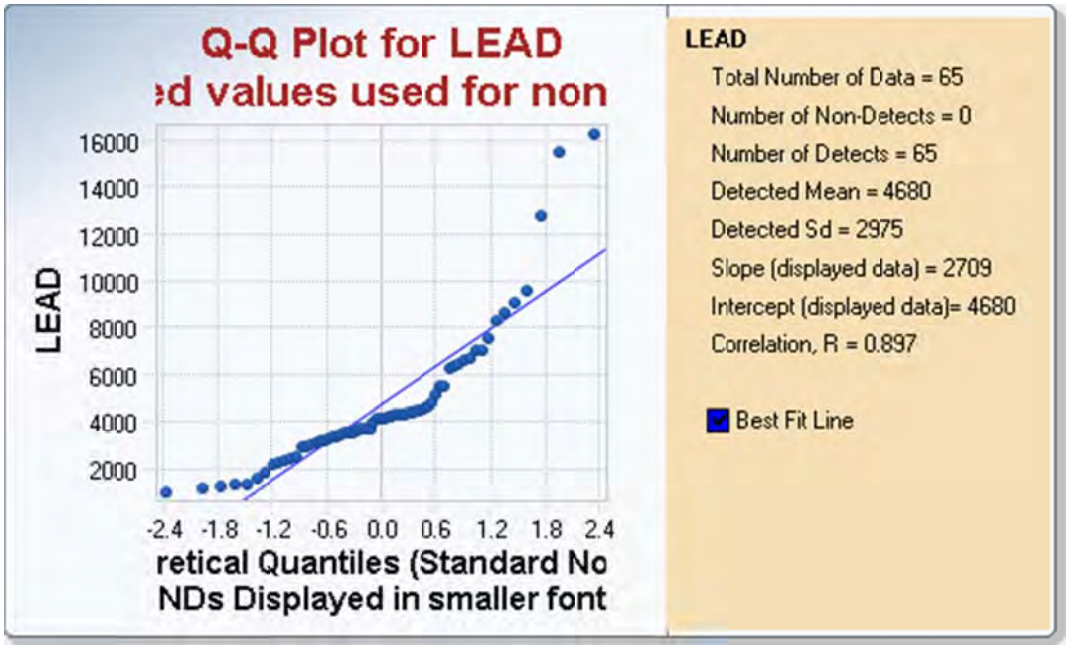

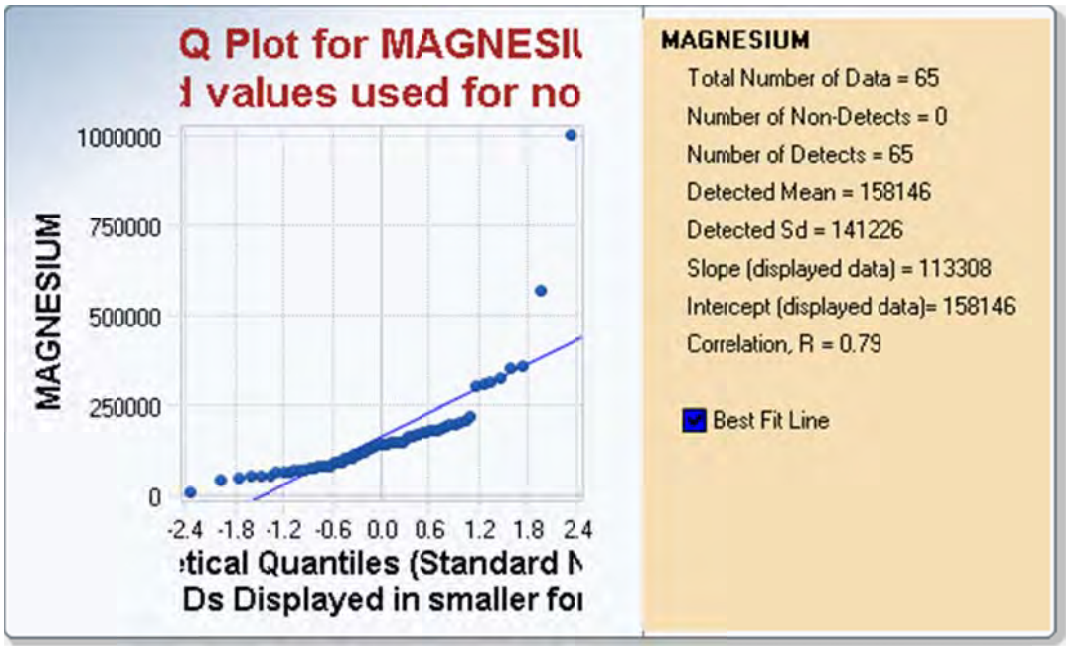

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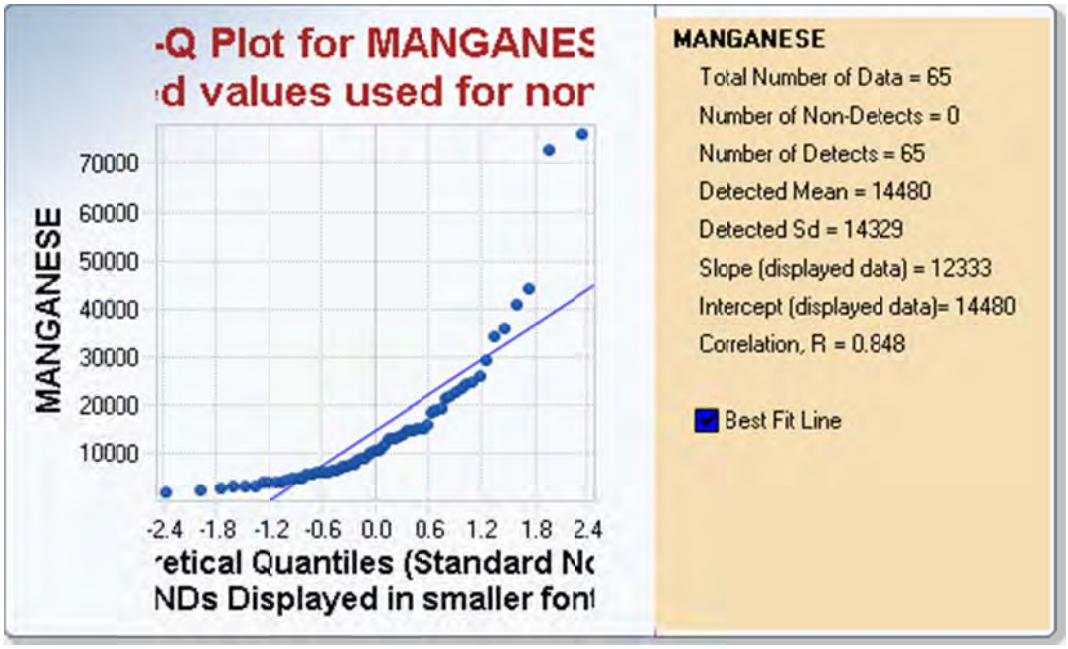

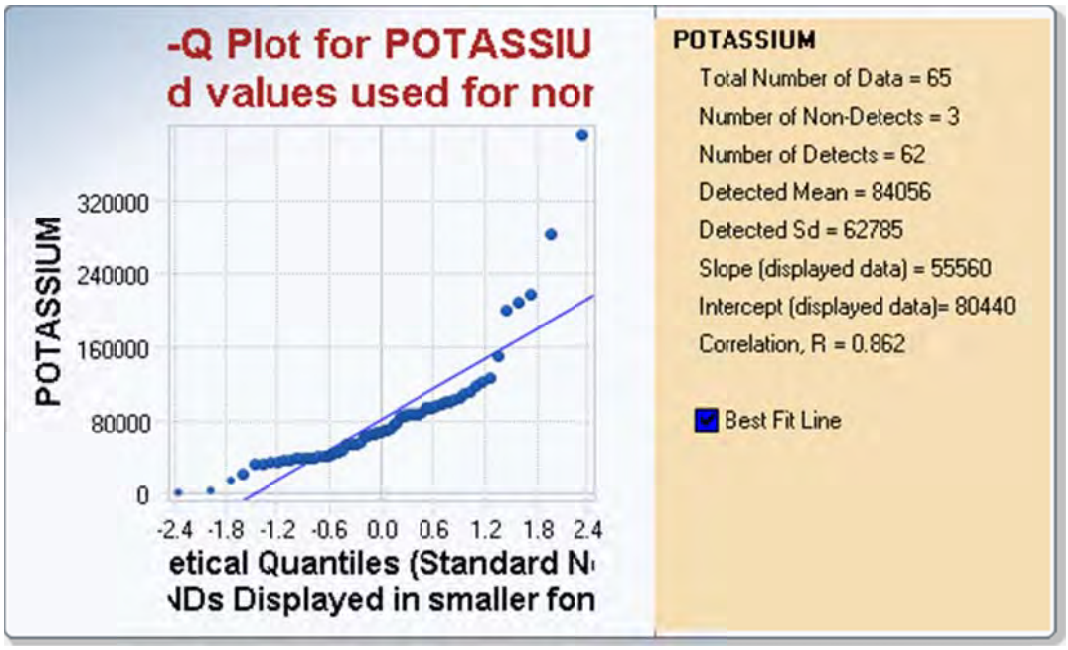

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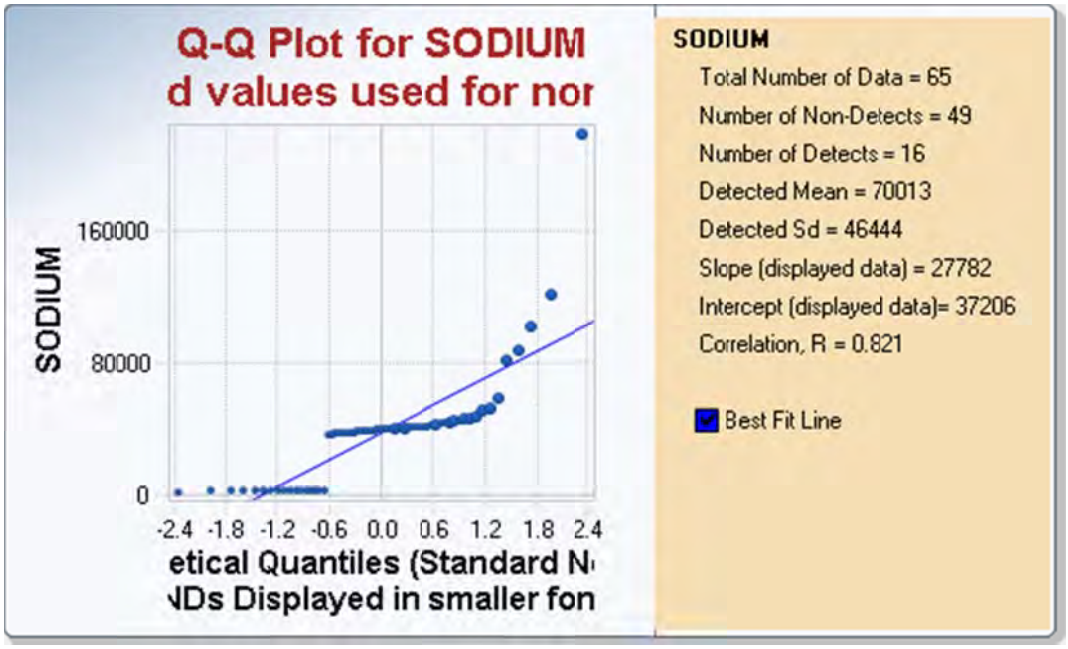
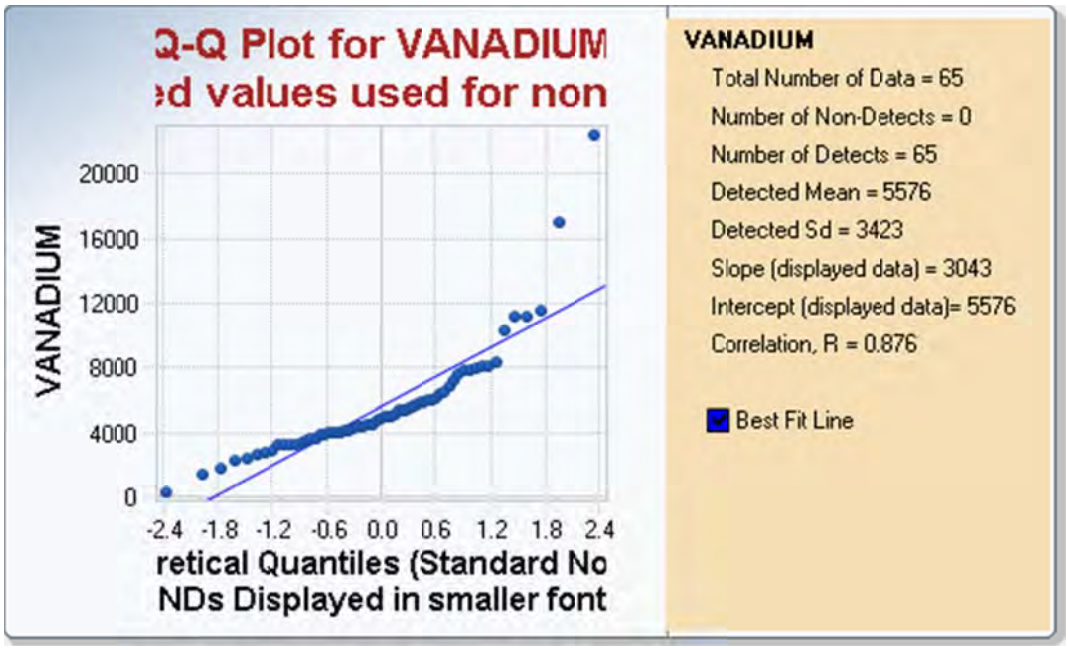
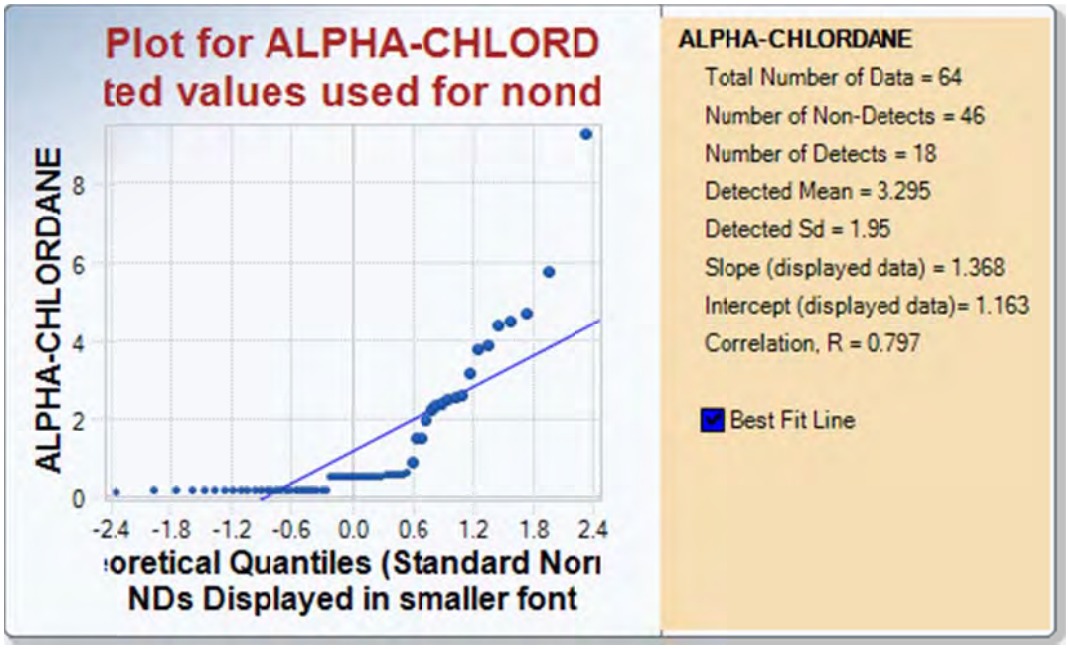
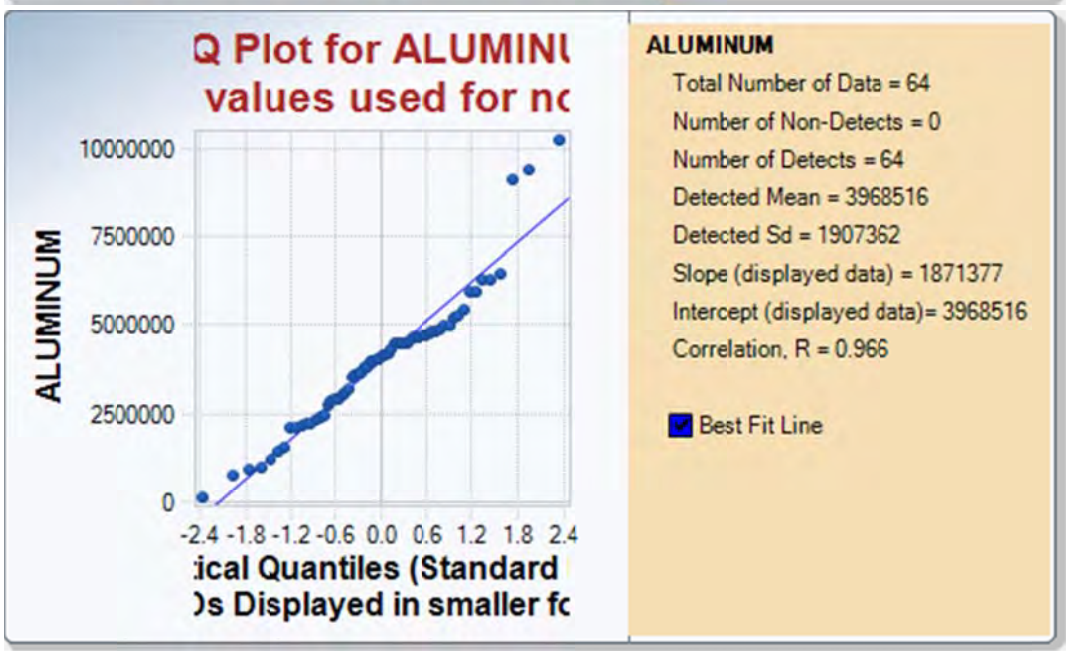




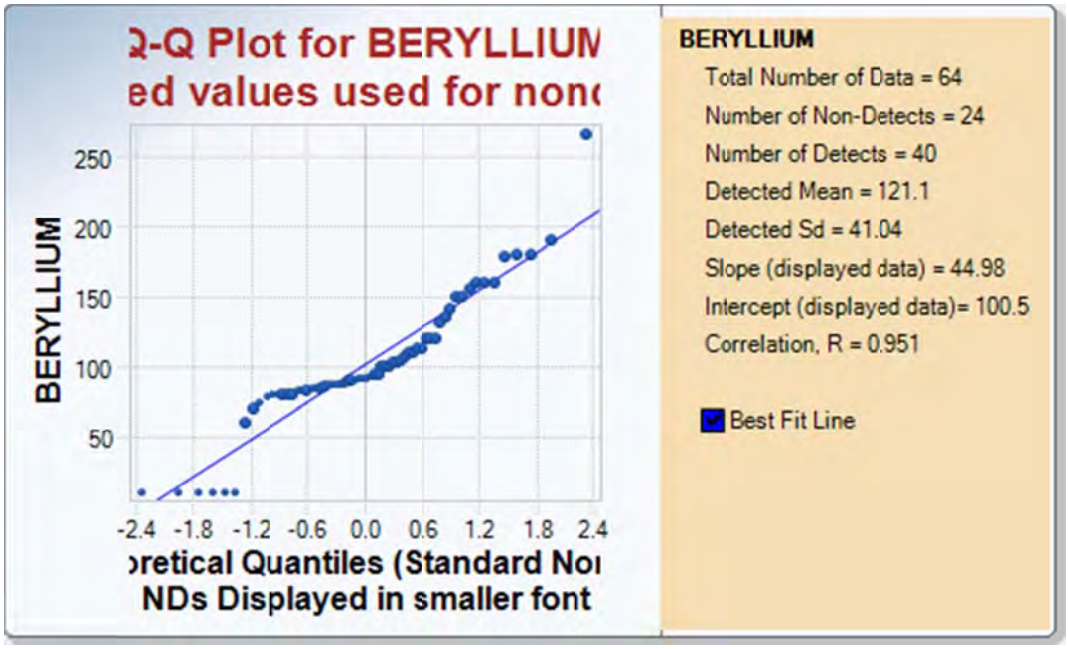
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

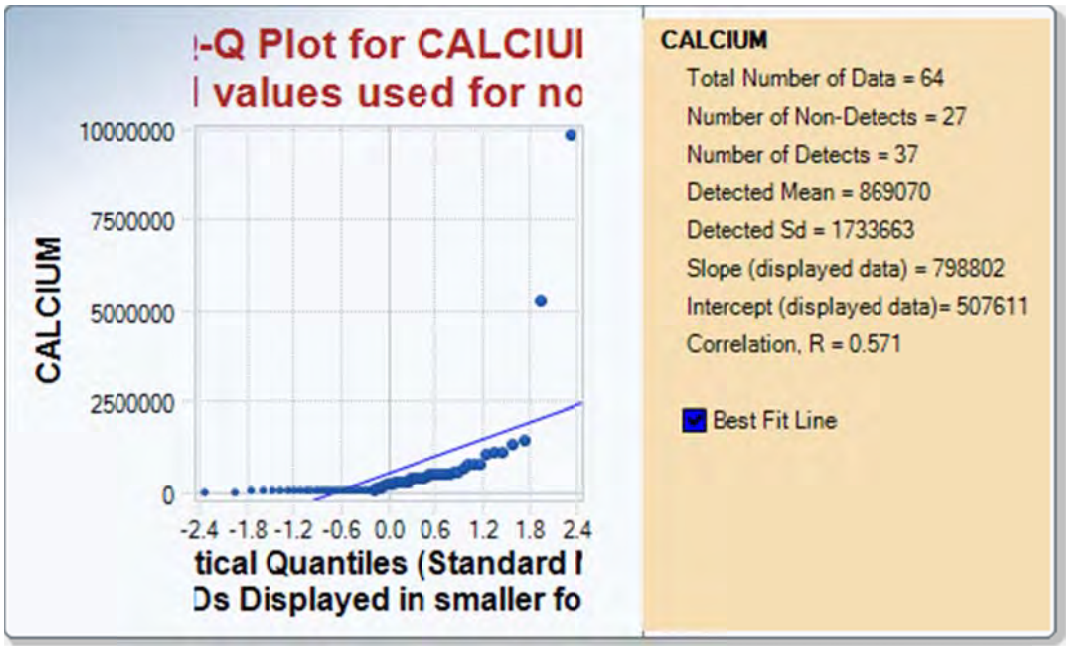
Iteration 3



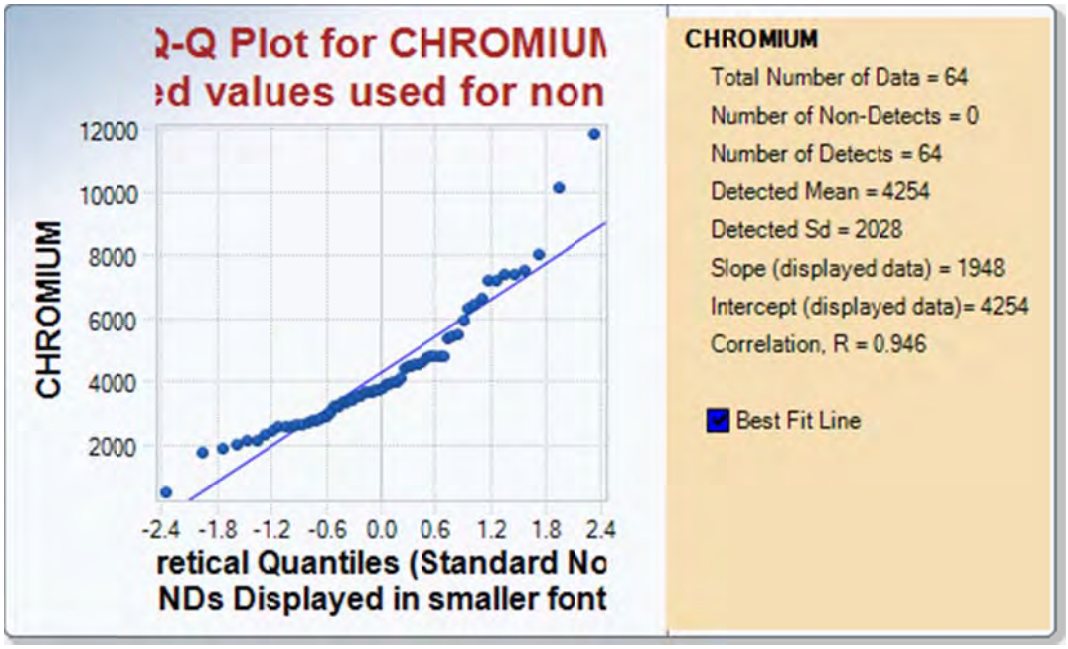


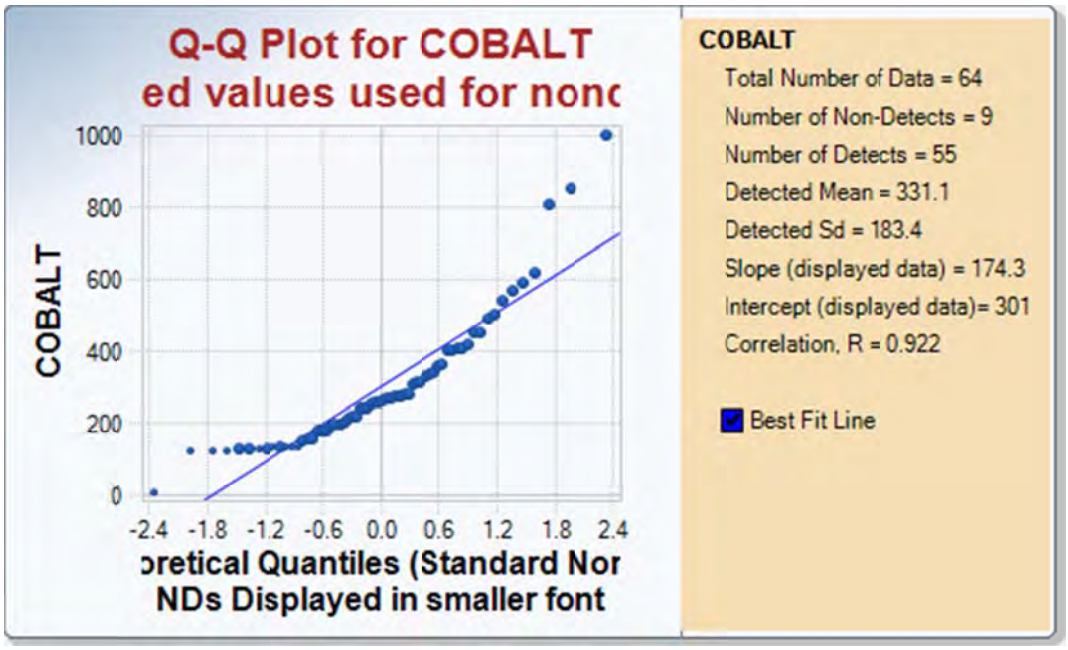
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





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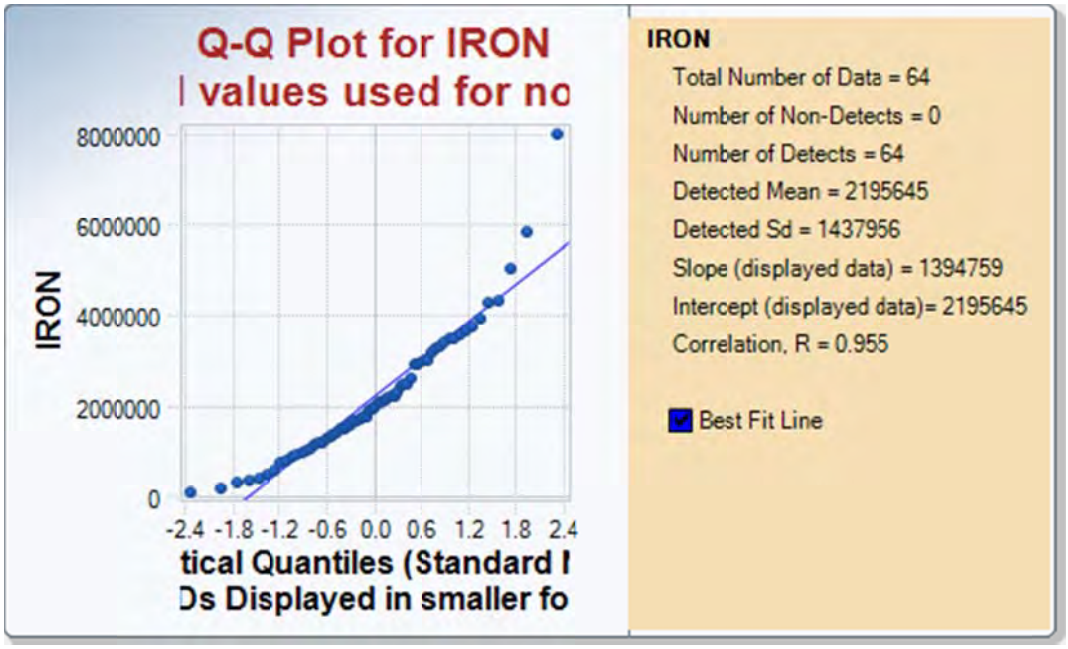

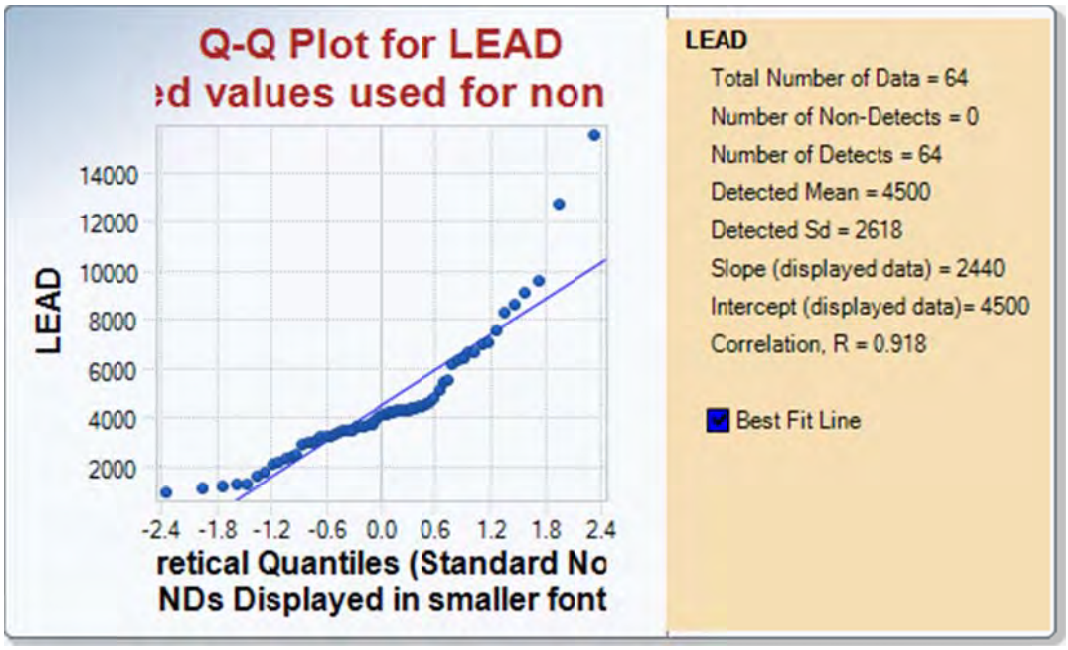

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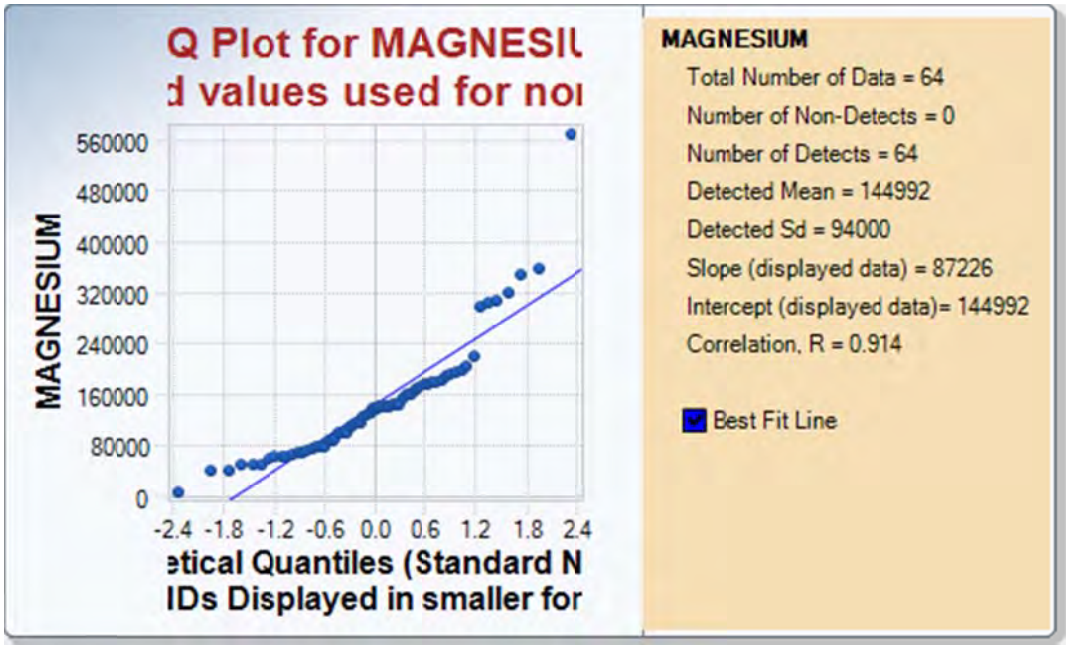
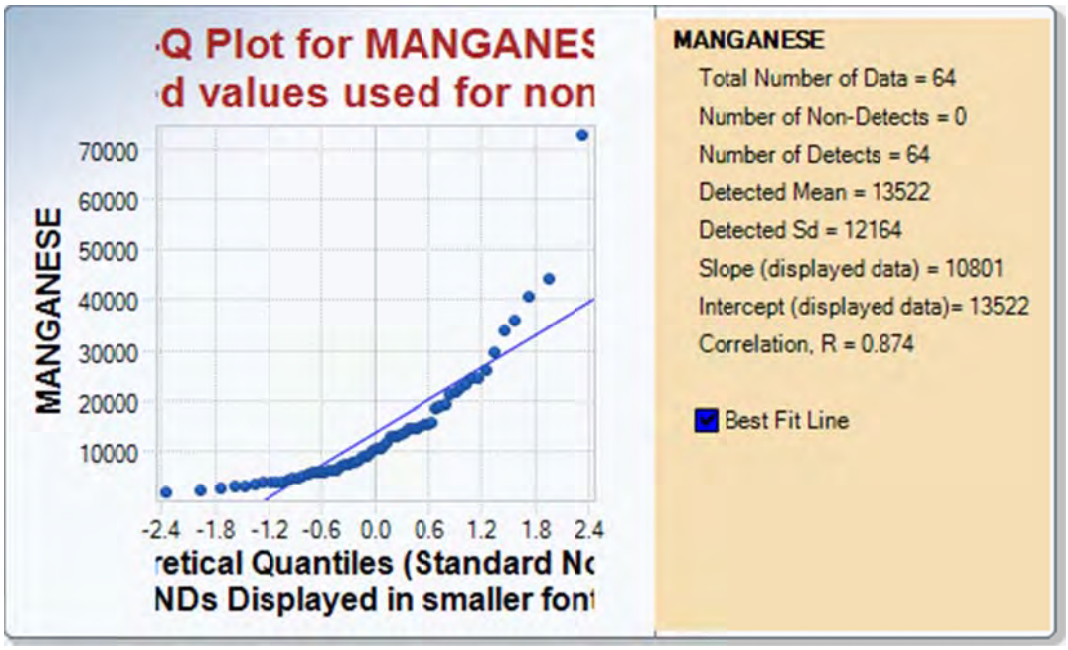
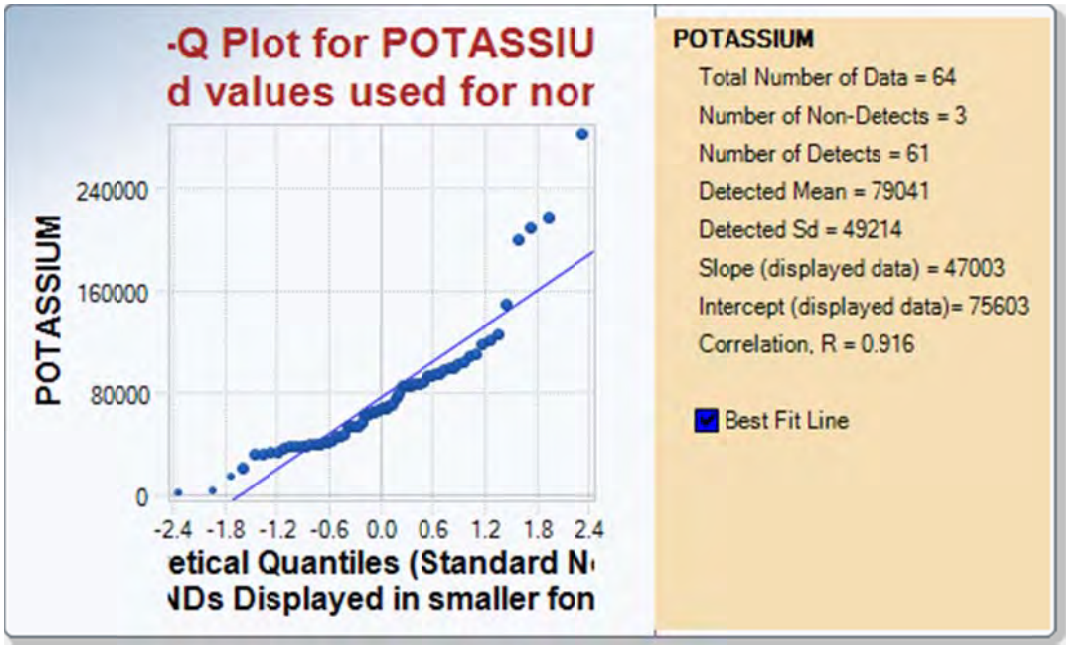
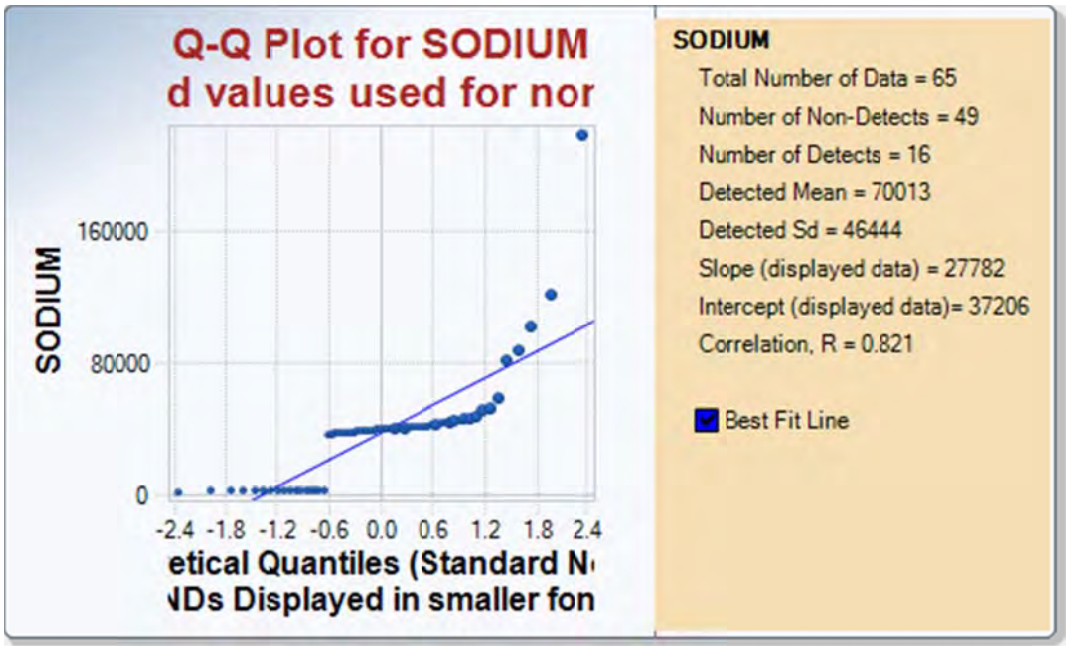


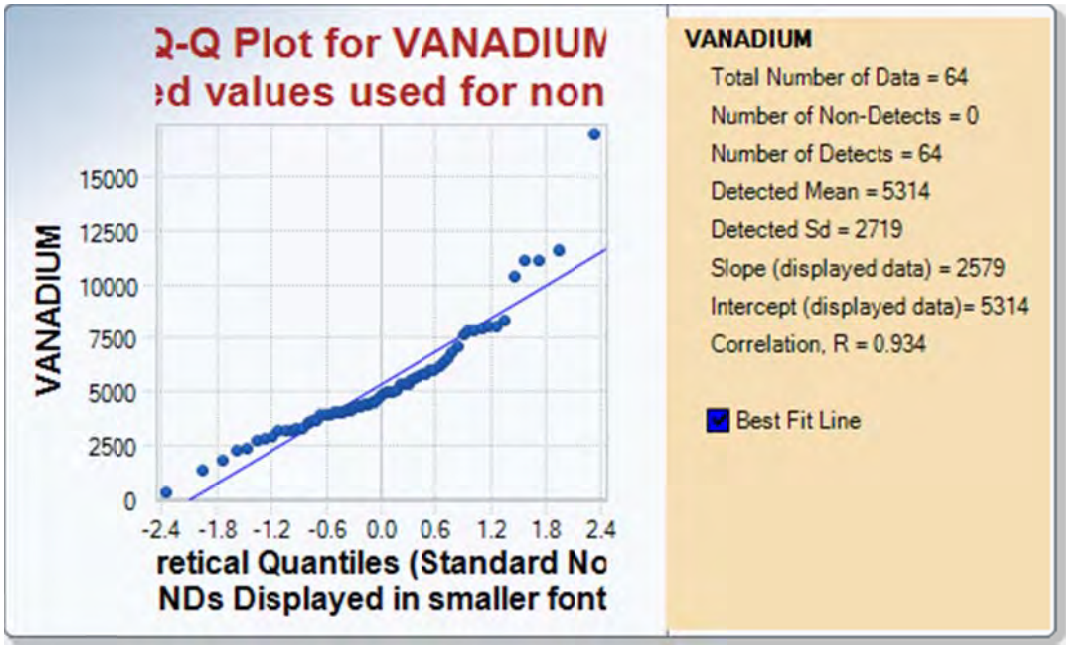


Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



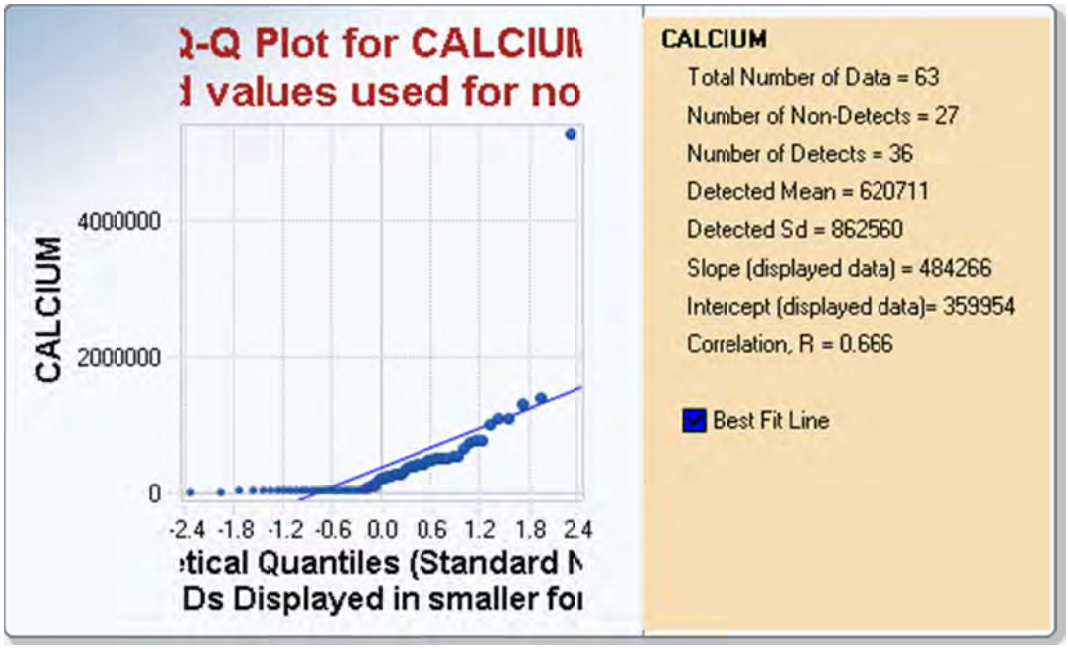


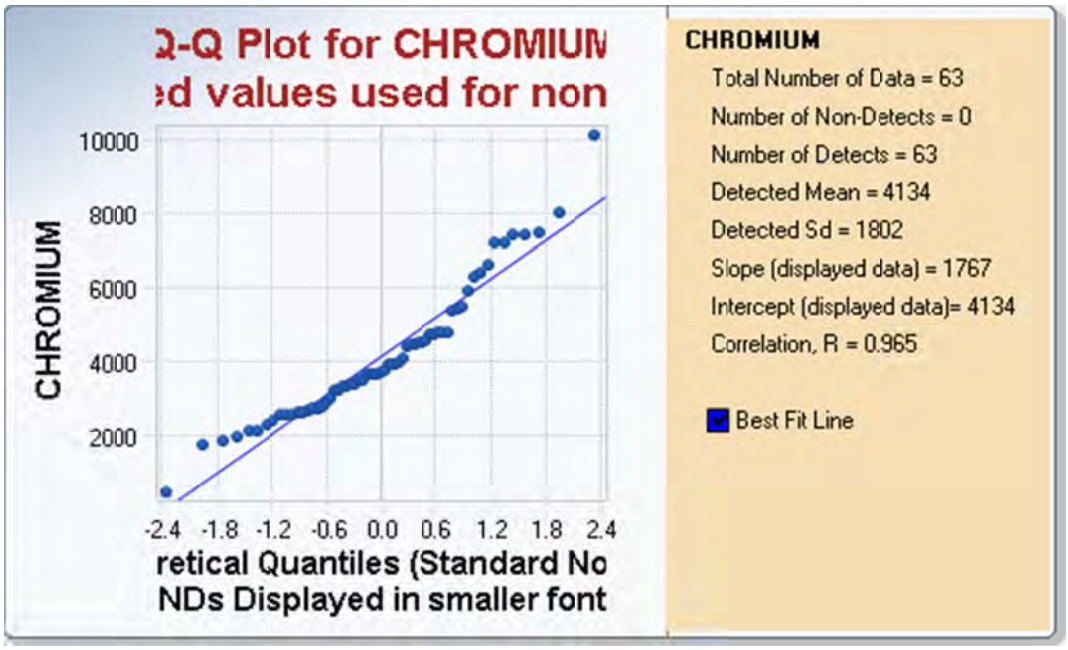
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



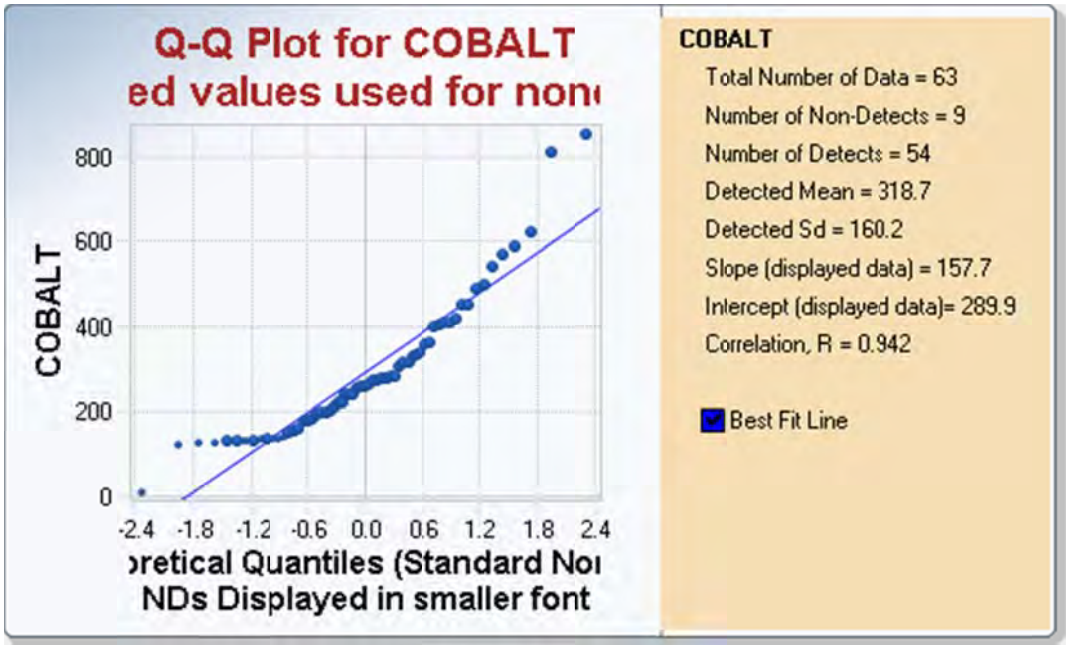
Iteration 4

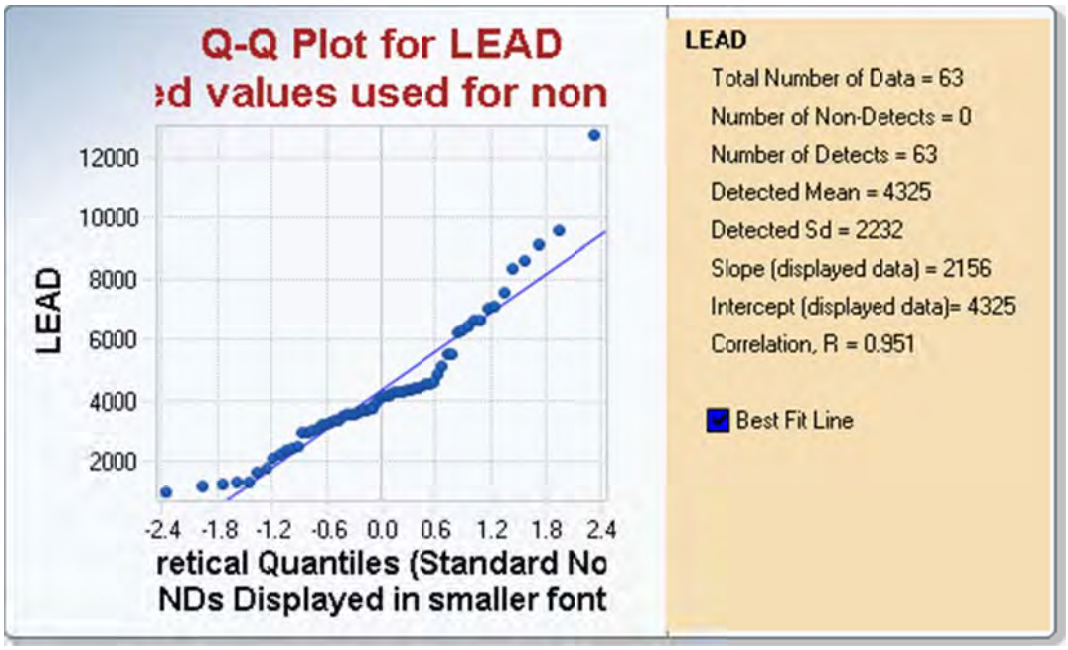
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



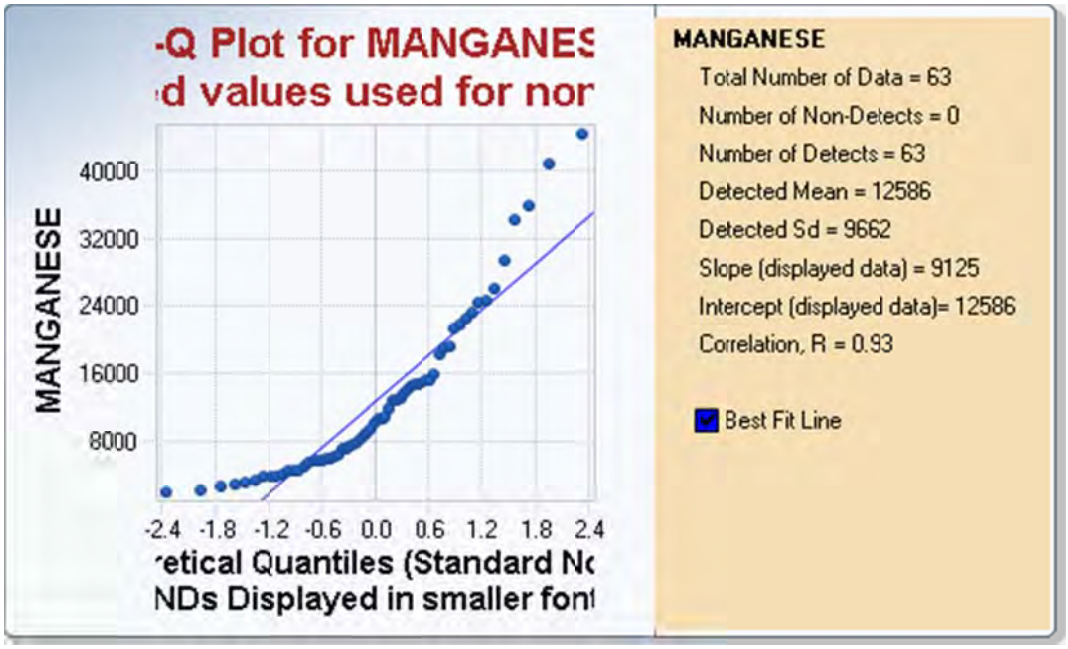


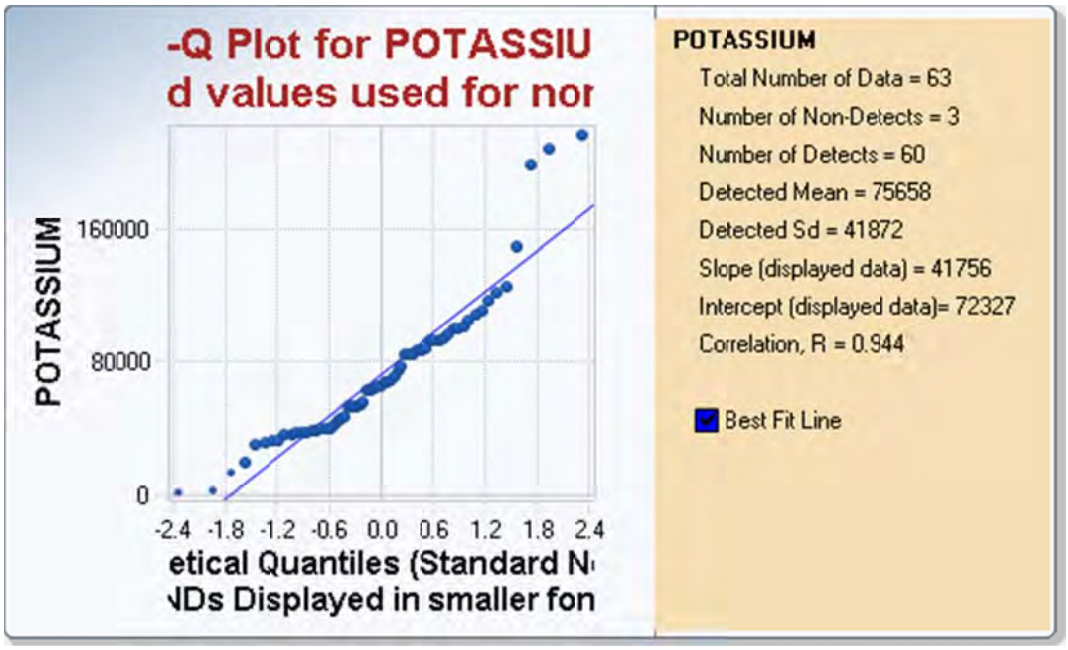
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





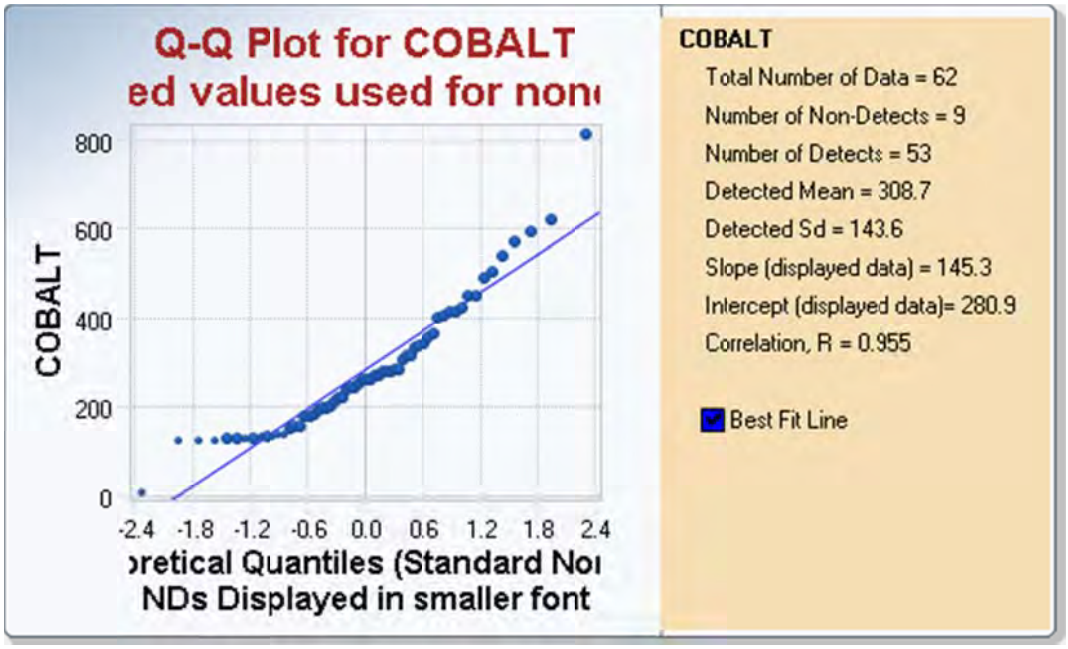
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL



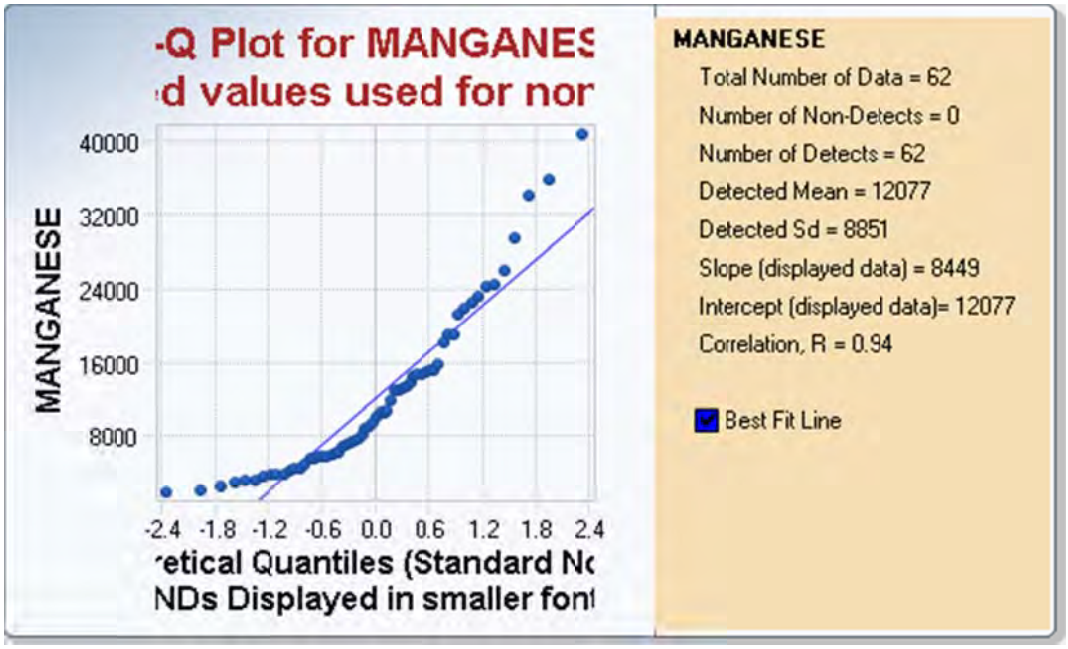


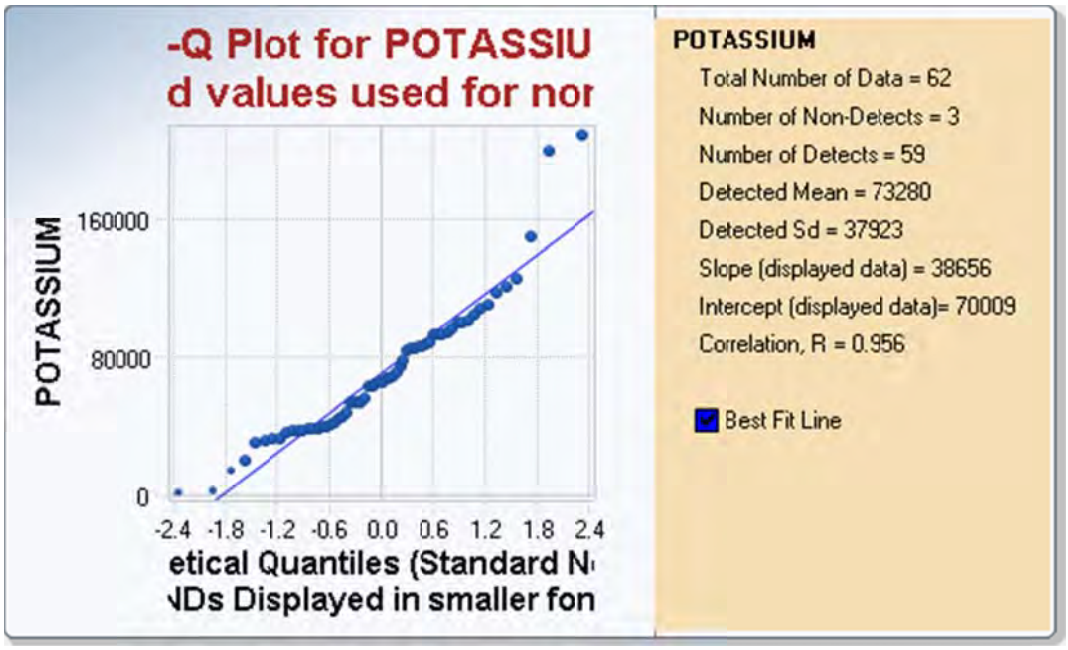
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

Iteration 5



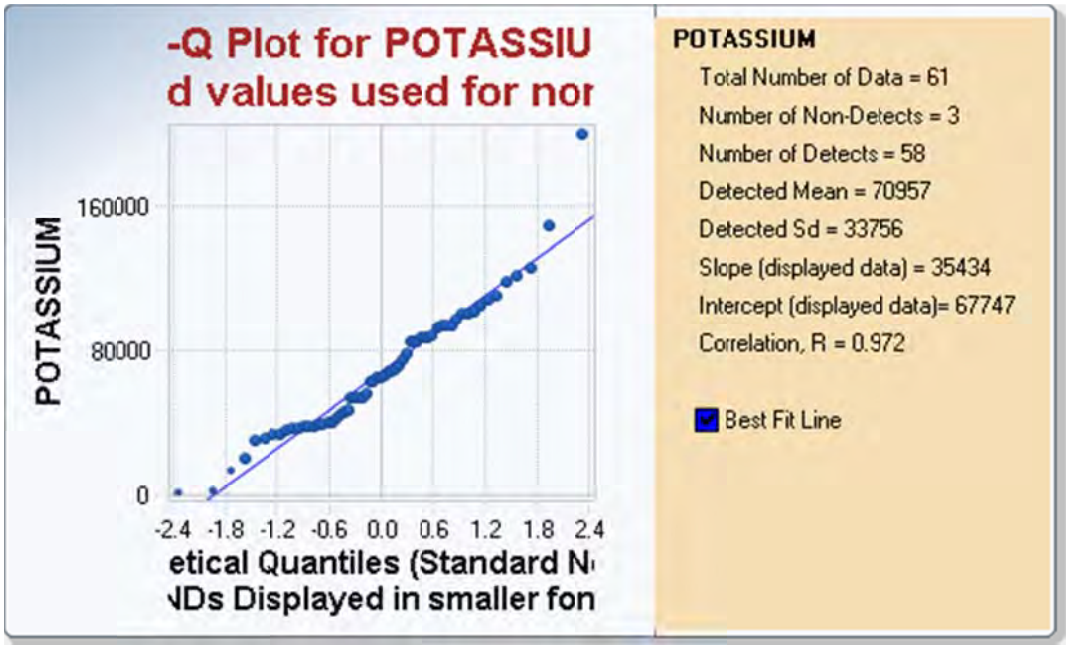
Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL





Q-Q Plots for Soil Data Sets After Excluding Outliers Identified By ProUCL

Iteration 6



Appendix B3
Sediment Outlier Test Iterations

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ITERATION 1

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation 5/19/2015 1:24:58 PM

From File A2 Sediment ProUCL Dataset.xls

Full Precision ON

Dixon's Outlier Test for ALUMINUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 7090000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.086

For 10% significance level, 7090000 is not an outlier.

For 5% significance level, 7090000 is not an outlier.

For 1% significance level, 7090000 is not an outlier.

2. Data Value 888000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.028

For 10% significance level, 888000 is not an outlier.

For 5% significance level, 888000 is not an outlier.

For 1% significance level, 888000 is not an outlier.

Dixon's Outlier Test for ARSENIC

Total N = 11

Number NDs = 5

Number Detects = 6

10% critical value: 0.482

5% critical value: 0.56

1% critical value: 0.698

Note: NDs excluded from Outlier Test

1. Data Value 5660 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.113

For 10% significance level, 5660 is not an outlier.

For 5% significance level, 5660 is not an outlier.

For 1% significance level, 5660 is not an outlier.

2. Data Value 990 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.274

For 10% significance level, 990 is not an outlier.
For 5% significance level, 990 is not an outlier.
For 1% significance level, 990 is not an outlier.

Dixon's Outlier Test for BARIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 18600 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.522

For 10% significance level, 18600 is an outlier.
For 5% significance level, 18600 is not an outlier.
For 1% significance level, 18600 is not an outlier.

2. Data Value 2230 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.063

For 10% significance level, 2230 is not an outlier.
For 5% significance level, 2230 is not an outlier.
For 1% significance level, 2230 is not an outlier.

Dixon's Outlier Test for BERYLLIUM

Total N = 11
Number NDs = 7
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 416 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.124

For 10% significance level, 416 is not an outlier.
For 5% significance level, 416 is not an outlier.
For 1% significance level, 416 is not an outlier.

2. Data Value 165 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.857

For 10% significance level, 165 is an outlier.
For 5% significance level, 165 is an outlier.
For 1% significance level, 165 is not an outlier.

Dixon's Outlier Test for CALCIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 1960000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.355

For 10% significance level, 1960000 is not an outlier.
For 5% significance level, 1960000 is not an outlier.
For 1% significance level, 1960000 is not an outlier.

2. Data Value 387000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.140

For 10% significance level, 387000 is not an outlier.
For 5% significance level, 387000 is not an outlier.
For 1% significance level, 387000 is not an outlier.

Dixon's Outlier Test for CARBON DISULFIDE

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.146

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 2.7 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.091

For 10% significance level, 2.7 is not an outlier.
For 5% significance level, 2.7 is not an outlier.
For 1% significance level, 2.7 is not an outlier.

Dixon's Outlier Test for CHROMIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 13700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.309

For 10% significance level, 13700 is not an outlier.
For 5% significance level, 13700 is not an outlier.
For 1% significance level, 13700 is not an outlier.

2. Data Value 1330 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.060

For 10% significance level, 1330 is not an outlier.
For 5% significance level, 1330 is not an outlier.
For 1% significance level, 1330 is not an outlier.

Dixon's Outlier Test for COBALT

Total N = 11
Number NDs = 3
Number Detects = 8
10% critical value: 0.479
5% critical value: 0.554
1% critical value: 0.683
Note: NDs excluded from Outlier Test

1. Data Value 2330 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.218

For 10% significance level, 2330 is not an outlier.
For 5% significance level, 2330 is not an outlier.

For 1% significance level, 2330 is not an outlier.

2. Data Value 261 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.060

For 10% significance level, 261 is not an outlier.
For 5% significance level, 261 is not an outlier.
For 1% significance level, 261 is not an outlier.

Dixon's Outlier Test for COPPER

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 23000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.692

For 10% significance level, 23000 is an outlier.
For 5% significance level, 23000 is an outlier.
For 1% significance level, 23000 is an outlier.

2. Data Value 1570 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.022

For 10% significance level, 1570 is not an outlier.
For 5% significance level, 1570 is not an outlier.
For 1% significance level, 1570 is not an outlier.

Dixon's Outlier Test for ENDRIN KETONE

Total N = 11
Number NDs = 7
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 76.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.902

For 10% significance level, 76.5 is an outlier.

For 5% significance level, 76.5 is an outlier.

For 1% significance level, 76.5 is an outlier.

2. Data Value 12 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.014

For 10% significance level, 12 is not an outlier.

For 5% significance level, 12 is not an outlier.

For 1% significance level, 12 is not an outlier.

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Dixon's Outlier Test for IRON

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 10200000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.261

For 10% significance level, 10200000 is not an outlier.

For 5% significance level, 10200000 is not an outlier.

For 1% significance level, 10200000 is not an outlier.

2. Data Value 486000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.046

For 10% significance level, 486000 is not an outlier.

For 5% significance level, 486000 is not an outlier.

For 1% significance level, 486000 is not an outlier.

Dixon's Outlier Test for LEAD

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 12700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.376

For 10% significance level, 12700 is not an outlier.
For 5% significance level, 12700 is not an outlier.
For 1% significance level, 12700 is not an outlier.

2. Data Value 1490 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.307

For 10% significance level, 1490 is not an outlier.
For 5% significance level, 1490 is not an outlier.
For 1% significance level, 1490 is not an outlier.

Dixon's Outlier Test for MAGNESIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 3400000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.173

For 10% significance level, 3400000 is not an outlier.
For 5% significance level, 3400000 is not an outlier.
For 1% significance level, 3400000 is not an outlier.

2. Data Value 348000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.138

For 10% significance level, 348000 is not an outlier.
For 5% significance level, 348000 is not an outlier.
For 1% significance level, 348000 is not an outlier.

Dixon's Outlier Test for MANGANESE

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 67900 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.512

For 10% significance level, 67900 is not an outlier.
For 5% significance level, 67900 is not an outlier.
For 1% significance level, 67900 is not an outlier.

2. Data Value 3600 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.053

For 10% significance level, 3600 is not an outlier.
For 5% significance level, 3600 is not an outlier.
For 1% significance level, 3600 is not an outlier.

Dixon's Outlier Test for MERCURY

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 290 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.389

For 10% significance level, 290 is not an outlier.
For 5% significance level, 290 is not an outlier.
For 1% significance level, 290 is not an outlier.

2. Data Value 27 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.130

For 10% significance level, 27 is not an outlier.
For 5% significance level, 27 is not an outlier.
For 1% significance level, 27 is not an outlier.

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL_ACETATE

Dixon's Outlier Test for NICKEL

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517

5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 3970 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.456

For 10% significance level, 3970 is not an outlier.
For 5% significance level, 3970 is not an outlier.
For 1% significance level, 3970 is not an outlier.

2. Data Value 477 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.074

For 10% significance level, 477 is not an outlier.
For 5% significance level, 477 is not an outlier.
For 1% significance level, 477 is not an outlier.

Dixon's Outlier Test for POTASSIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 2060000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.169

For 10% significance level, 2060000 is not an outlier.
For 5% significance level, 2060000 is not an outlier.
For 1% significance level, 2060000 is not an outlier.

2. Data Value 134000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.112

For 10% significance level, 134000 is not an outlier.
For 5% significance level, 134000 is not an outlier.
For 1% significance level, 134000 is not an outlier.

Dixon's Outlier Test for SELENIUM

Total N = 11
Number NDs = 8
Number Detects = 3

10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 1670 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.091

For 10% significance level, 1670 is not an outlier.
For 5% significance level, 1670 is not an outlier.
For 1% significance level, 1670 is not an outlier.

2. Data Value 1120 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.909

For 10% significance level, 1120 is an outlier.
For 5% significance level, 1120 is not an outlier.
For 1% significance level, 1120 is not an outlier.

Dixon's Outlier Test for SODIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 14900000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.398

For 10% significance level, 14900000 is not an outlier.
For 5% significance level, 14900000 is not an outlier.
For 1% significance level, 14900000 is not an outlier.

2. Data Value 135000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.267

For 10% significance level, 135000 is not an outlier.
For 5% significance level, 135000 is not an outlier.
For 1% significance level, 135000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for VANADIUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 22700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.358

For 10% significance level, 22700 is not an outlier.

For 5% significance level, 22700 is not an outlier.

For 1% significance level, 22700 is not an outlier.

2. Data Value 2480 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.029

For 10% significance level, 2480 is not an outlier.

For 5% significance level, 2480 is not an outlier.

For 1% significance level, 2480 is not an outlier.

Dixon's Outlier Test for ZINC

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 55200 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.549

For 10% significance level, 55200 is an outlier.

For 5% significance level, 55200 is not an outlier.

For 1% significance level, 55200 is not an outlier.

2. Data Value 3500 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.013

For 10% significance level, 3500 is not an outlier.

For 5% significance level, 3500 is not an outlier.

For 1% significance level, 3500 is not an outlier.

OUTLIER ITERATION 2

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	5/19/2015 1:29:54 PM
From File	A2 Sediment ProUCL Dataset.xls
Full Precision	ON

Dixon's Outlier Test for ALUMINUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 7090000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.086

For 10% significance level, 7090000 is not an outlier.

For 5% significance level, 7090000 is not an outlier.

For 1% significance level, 7090000 is not an outlier.

2. Data Value 888000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.028

For 10% significance level, 888000 is not an outlier.

For 5% significance level, 888000 is not an outlier.

For 1% significance level, 888000 is not an outlier.

Dixon's Outlier Test for ARSENIC

Total N = 11

Number NDs = 5

Number Detects = 6

10% critical value: 0.482

5% critical value: 0.56

1% critical value: 0.698

Note: NDs excluded from Outlier Test

1. Data Value 5660 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.113

For 10% significance level, 5660 is not an outlier.

For 5% significance level, 5660 is not an outlier.

For 1% significance level, 5660 is not an outlier.

2. Data Value 990 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.274

For 10% significance level, 990 is not an outlier.
For 5% significance level, 990 is not an outlier.
For 1% significance level, 990 is not an outlier.

Dixon's Outlier Test for BARIUM

Total N = 10
Number NDs = 0
Number Detects = 10
10% critical value: 0.409
5% critical value: 0.477
1% critical value: 0.597
Note: NDs excluded from Outlier Test

1. Data Value 13000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.257

For 10% significance level, 13000 is not an outlier.
For 5% significance level, 13000 is not an outlier.
For 1% significance level, 13000 is not an outlier.

2. Data Value 2230 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.082

For 10% significance level, 2230 is not an outlier.
For 5% significance level, 2230 is not an outlier.
For 1% significance level, 2230 is not an outlier.

Dixon's Outlier Test for BERYLLIUM

Total N = 10
Number NDs = 7
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 416 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.861

For 10% significance level, 416 is not an outlier.
For 5% significance level, 416 is not an outlier.
For 1% significance level, 416 is not an outlier.

2. Data Value 380 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.139

For 10% significance level, 380 is not an outlier.
For 5% significance level, 380 is not an outlier.
For 1% significance level, 380 is not an outlier.

Dixon's Outlier Test for CALCIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 1960000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.355

For 10% significance level, 1960000 is not an outlier.
For 5% significance level, 1960000 is not an outlier.
For 1% significance level, 1960000 is not an outlier.

2. Data Value 387000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.140

For 10% significance level, 387000 is not an outlier.
For 5% significance level, 387000 is not an outlier.
For 1% significance level, 387000 is not an outlier.

Dixon's Outlier Test for CARBON DISULFIDE

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.146

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 2.7 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.091

For 10% significance level, 2.7 is not an outlier.
For 5% significance level, 2.7 is not an outlier.
For 1% significance level, 2.7 is not an outlier.

Dixon's Outlier Test for CHROMIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 13700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.309

For 10% significance level, 13700 is not an outlier.
For 5% significance level, 13700 is not an outlier.
For 1% significance level, 13700 is not an outlier.

2. Data Value 1330 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.060

For 10% significance level, 1330 is not an outlier.
For 5% significance level, 1330 is not an outlier.
For 1% significance level, 1330 is not an outlier.

Dixon's Outlier Test for COBALT

Total N = 11
Number NDs = 3
Number Detects = 8
10% critical value: 0.479
5% critical value: 0.554
1% critical value: 0.683
Note: NDs excluded from Outlier Test

1. Data Value 2330 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.218

For 10% significance level, 2330 is not an outlier.
For 5% significance level, 2330 is not an outlier.
For 1% significance level, 2330 is not an outlier.

2. Data Value 261 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.060

For 10% significance level, 261 is not an outlier.
For 5% significance level, 261 is not an outlier.
For 1% significance level, 261 is not an outlier.

Dixon's Outlier Test for COPPER

Total N = 10
Number NDs = 0
Number Detects = 10
10% critical value: 0.409
5% critical value: 0.477
1% critical value: 0.597
Note: NDs excluded from Outlier Test

1. Data Value 12700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.404

For 10% significance level, 12700 is not an outlier.
For 5% significance level, 12700 is not an outlier.
For 1% significance level, 12700 is not an outlier.

2. Data Value 1570 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.013

For 10% significance level, 1570 is not an outlier.
For 5% significance level, 1570 is not an outlier.
For 1% significance level, 1570 is not an outlier.

Dixon's Outlier Test for ENDRIN KETONE

Total N = 10
Number NDs = 7
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 18.3 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.857

For 10% significance level, 18.3 is not an outlier.
For 5% significance level, 18.3 is not an outlier.

For 1% significance level, 18.3 is not an outlier.

2. Data Value 12 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.143

For 10% significance level, 12 is not an outlier.
For 5% significance level, 12 is not an outlier.
For 1% significance level, 12 is not an outlier.

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Dixon's Outlier Test for IRON

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 10200000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.261

For 10% significance level, 10200000 is not an outlier.
For 5% significance level, 10200000 is not an outlier.
For 1% significance level, 10200000 is not an outlier.

2. Data Value 486000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.046

For 10% significance level, 486000 is not an outlier.
For 5% significance level, 486000 is not an outlier.
For 1% significance level, 486000 is not an outlier.

Dixon's Outlier Test for LEAD

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 12700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.376

For 10% significance level, 12700 is not an outlier.
For 5% significance level, 12700 is not an outlier.
For 1% significance level, 12700 is not an outlier.

2. Data Value 1490 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.307

For 10% significance level, 1490 is not an outlier.
For 5% significance level, 1490 is not an outlier.
For 1% significance level, 1490 is not an outlier.

Dixon's Outlier Test for MAGNESIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 3400000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.173

For 10% significance level, 3400000 is not an outlier.
For 5% significance level, 3400000 is not an outlier.
For 1% significance level, 3400000 is not an outlier.

2. Data Value 348000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.138

For 10% significance level, 348000 is not an outlier.
For 5% significance level, 348000 is not an outlier.
For 1% significance level, 348000 is not an outlier.

Dixon's Outlier Test for MANGANESE

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 67900 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.512

For 10% significance level, 67900 is not an outlier.
For 5% significance level, 67900 is not an outlier.
For 1% significance level, 67900 is not an outlier.

2. Data Value 3600 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.053

For 10% significance level, 3600 is not an outlier.
For 5% significance level, 3600 is not an outlier.
For 1% significance level, 3600 is not an outlier.

Dixon's Outlier Test for MERCURY

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 290 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.389

For 10% significance level, 290 is not an outlier.
For 5% significance level, 290 is not an outlier.
For 1% significance level, 290 is not an outlier.

2. Data Value 27 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.130

For 10% significance level, 27 is not an outlier.
For 5% significance level, 27 is not an outlier.
For 1% significance level, 27 is not an outlier.

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL_ACETATE

Dixon's Outlier Test for NICKEL

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 3970 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.456

For 10% significance level, 3970 is not an outlier.

For 5% significance level, 3970 is not an outlier.

For 1% significance level, 3970 is not an outlier.

2. Data Value 477 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.074

For 10% significance level, 477 is not an outlier.

For 5% significance level, 477 is not an outlier.

For 1% significance level, 477 is not an outlier.

Dixon's Outlier Test for POTASSIUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 2060000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.169

For 10% significance level, 2060000 is not an outlier.

For 5% significance level, 2060000 is not an outlier.

For 1% significance level, 2060000 is not an outlier.

2. Data Value 134000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.112

For 10% significance level, 134000 is not an outlier.

For 5% significance level, 134000 is not an outlier.

For 1% significance level, 134000 is not an outlier.

No Outlier Test for SELENIUM

Dixon's Outlier Test for SODIUM

Total N = 11

Number NDs = 0

Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 14900000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.398

For 10% significance level, 14900000 is not an outlier.
For 5% significance level, 14900000 is not an outlier.
For 1% significance level, 14900000 is not an outlier.

2. Data Value 135000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.267

For 10% significance level, 135000 is not an outlier.
For 5% significance level, 135000 is not an outlier.
For 1% significance level, 135000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for VANADIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 22700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.358

For 10% significance level, 22700 is not an outlier.
For 5% significance level, 22700 is not an outlier.
For 1% significance level, 22700 is not an outlier.

2. Data Value 2480 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.029

For 10% significance level, 2480 is not an outlier.
For 5% significance level, 2480 is not an outlier.
For 1% significance level, 2480 is not an outlier.

Dixon's Outlier Test for ZINC

Total N = 10

Number NDs = 0

Number Detects = 10

10% critical value: 0.409

5% critical value: 0.477

1% critical value: 0.597

Note: NDs excluded from Outlier Test

1. Data Value 52100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.520

For 10% significance level, 52100 is an outlier.

For 5% significance level, 52100 is an outlier.

For 1% significance level, 52100 is not an outlier.

2. Data Value 3500 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.023

For 10% significance level, 3500 is not an outlier.

For 5% significance level, 3500 is not an outlier.

For 1% significance level, 3500 is not an outlier.

OUTLIER ITERATION 3

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	5/19/2015 1:30:59 PM
From File	A2 Sediment ProUCL Dataset.xls
Full Precision	ON

Dixon's Outlier Test for ALUMINUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 7090000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.086

For 10% significance level, 7090000 is not an outlier.

For 5% significance level, 7090000 is not an outlier.

For 1% significance level, 7090000 is not an outlier.

2. Data Value 888000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.028

For 10% significance level, 888000 is not an outlier.
For 5% significance level, 888000 is not an outlier.
For 1% significance level, 888000 is not an outlier.

Dixon's Outlier Test for ARSENIC

Total N = 11
Number NDs = 5
Number Detects = 6
10% critical value: 0.482
5% critical value: 0.56
1% critical value: 0.698
Note: NDs excluded from Outlier Test

1. Data Value 5660 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.113

For 10% significance level, 5660 is not an outlier.
For 5% significance level, 5660 is not an outlier.
For 1% significance level, 5660 is not an outlier.

2. Data Value 990 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.274

For 10% significance level, 990 is not an outlier.
For 5% significance level, 990 is not an outlier.
For 1% significance level, 990 is not an outlier.

Dixon's Outlier Test for BARIUM

Total N = 10
Number NDs = 0
Number Detects = 10
10% critical value: 0.409
5% critical value: 0.477
1% critical value: 0.597
Note: NDs excluded from Outlier Test

1. Data Value 13000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.257

For 10% significance level, 13000 is not an outlier.
For 5% significance level, 13000 is not an outlier.
For 1% significance level, 13000 is not an outlier.

2. Data Value 2230 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.082

For 10% significance level, 2230 is not an outlier.
For 5% significance level, 2230 is not an outlier.
For 1% significance level, 2230 is not an outlier.

Dixon's Outlier Test for BERYLLIUM

Total N = 10
Number NDs = 7
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 416 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.861

For 10% significance level, 416 is not an outlier.
For 5% significance level, 416 is not an outlier.
For 1% significance level, 416 is not an outlier.

2. Data Value 380 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.139

For 10% significance level, 380 is not an outlier.
For 5% significance level, 380 is not an outlier.
For 1% significance level, 380 is not an outlier.

Dixon's Outlier Test for CALCIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 1960000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.355

For 10% significance level, 1960000 is not an outlier.
For 5% significance level, 1960000 is not an outlier.
For 1% significance level, 1960000 is not an outlier.

2. Data Value 387000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.140

For 10% significance level, 387000 is not an outlier.
For 5% significance level, 387000 is not an outlier.
For 1% significance level, 387000 is not an outlier.

Dixon's Outlier Test for CARBON DISULFIDE

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 1400 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.146

For 10% significance level, 1400 is not an outlier.
For 5% significance level, 1400 is not an outlier.
For 1% significance level, 1400 is not an outlier.

2. Data Value 2.7 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.091

For 10% significance level, 2.7 is not an outlier.
For 5% significance level, 2.7 is not an outlier.
For 1% significance level, 2.7 is not an outlier.

Dixon's Outlier Test for CHROMIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 13700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.309

For 10% significance level, 13700 is not an outlier.
For 5% significance level, 13700 is not an outlier.
For 1% significance level, 13700 is not an outlier.

2. Data Value 1330 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.060

For 10% significance level, 1330 is not an outlier.
For 5% significance level, 1330 is not an outlier.
For 1% significance level, 1330 is not an outlier.

Dixon's Outlier Test for COBALT

Total N = 11
Number NDs = 3
Number Detects = 8
10% critical value: 0.479
5% critical value: 0.554
1% critical value: 0.683
Note: NDs excluded from Outlier Test

1. Data Value 2330 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.218

For 10% significance level, 2330 is not an outlier.
For 5% significance level, 2330 is not an outlier.
For 1% significance level, 2330 is not an outlier.

2. Data Value 261 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.060

For 10% significance level, 261 is not an outlier.
For 5% significance level, 261 is not an outlier.
For 1% significance level, 261 is not an outlier.

Dixon's Outlier Test for COPPER

Total N = 10
Number NDs = 0
Number Detects = 10
10% critical value: 0.409
5% critical value: 0.477
1% critical value: 0.597
Note: NDs excluded from Outlier Test

1. Data Value 12700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.404

For 10% significance level, 12700 is not an outlier.
For 5% significance level, 12700 is not an outlier.
For 1% significance level, 12700 is not an outlier.

2. Data Value 1570 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.013

For 10% significance level, 1570 is not an outlier.
For 5% significance level, 1570 is not an outlier.
For 1% significance level, 1570 is not an outlier.

Dixon's Outlier Test for ENDRIN KETONE

Total N = 10
Number NDs = 7
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 18.3 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.857

For 10% significance level, 18.3 is not an outlier.
For 5% significance level, 18.3 is not an outlier.
For 1% significance level, 18.3 is not an outlier.

2. Data Value 12 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.143

For 10% significance level, 12 is not an outlier.
For 5% significance level, 12 is not an outlier.
For 1% significance level, 12 is not an outlier.

No Outlier Test for INDENO(1,2,3-CD)PYRENE

Dixon's Outlier Test for IRON

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 10200000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.261

For 10% significance level, 10200000 is not an outlier.
For 5% significance level, 10200000 is not an outlier.
For 1% significance level, 10200000 is not an outlier.

2. Data Value 486000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.046

For 10% significance level, 486000 is not an outlier.
For 5% significance level, 486000 is not an outlier.
For 1% significance level, 486000 is not an outlier.

Dixon's Outlier Test for LEAD

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 12700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.376

For 10% significance level, 12700 is not an outlier.
For 5% significance level, 12700 is not an outlier.
For 1% significance level, 12700 is not an outlier.

2. Data Value 1490 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.307

For 10% significance level, 1490 is not an outlier.
For 5% significance level, 1490 is not an outlier.
For 1% significance level, 1490 is not an outlier.

Dixon's Outlier Test for MAGNESIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 3400000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.173

For 10% significance level, 3400000 is not an outlier.
For 5% significance level, 3400000 is not an outlier.
For 1% significance level, 3400000 is not an outlier.

2. Data Value 348000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.138

For 10% significance level, 348000 is not an outlier.
For 5% significance level, 348000 is not an outlier.
For 1% significance level, 348000 is not an outlier.

Dixon's Outlier Test for MANGANESE

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 67900 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.512

For 10% significance level, 67900 is not an outlier.
For 5% significance level, 67900 is not an outlier.
For 1% significance level, 67900 is not an outlier.

2. Data Value 3600 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.053

For 10% significance level, 3600 is not an outlier.
For 5% significance level, 3600 is not an outlier.
For 1% significance level, 3600 is not an outlier.

Dixon's Outlier Test for MERCURY

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 290 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.389

For 10% significance level, 290 is not an outlier.
For 5% significance level, 290 is not an outlier.
For 1% significance level, 290 is not an outlier.

2. Data Value 27 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.130

For 10% significance level, 27 is not an outlier.
For 5% significance level, 27 is not an outlier.
For 1% significance level, 27 is not an outlier.

No Outlier Test for METHOXYCHLOR

No Outlier Test for METHYL_ACETATE

Dixon's Outlier Test for NICKEL

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576
1% critical value: 0.679
Note: NDs excluded from Outlier Test

1. Data Value 3970 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.456

For 10% significance level, 3970 is not an outlier.
For 5% significance level, 3970 is not an outlier.
For 1% significance level, 3970 is not an outlier.

2. Data Value 477 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.074

For 10% significance level, 477 is not an outlier.
For 5% significance level, 477 is not an outlier.
For 1% significance level, 477 is not an outlier.

Dixon's Outlier Test for POTASSIUM

Total N = 11
Number NDs = 0
Number Detects = 11
10% critical value: 0.517
5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 2060000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.169

For 10% significance level, 2060000 is not an outlier.

For 5% significance level, 2060000 is not an outlier.

For 1% significance level, 2060000 is not an outlier.

2. Data Value 134000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.112

For 10% significance level, 134000 is not an outlier.

For 5% significance level, 134000 is not an outlier.

For 1% significance level, 134000 is not an outlier.

No Outlier Test for SELENIUM

Dixon's Outlier Test for SODIUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 14900000 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.398

For 10% significance level, 14900000 is not an outlier.

For 5% significance level, 14900000 is not an outlier.

For 1% significance level, 14900000 is not an outlier.

2. Data Value 135000 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.267

For 10% significance level, 135000 is not an outlier.

For 5% significance level, 135000 is not an outlier.

For 1% significance level, 135000 is not an outlier.

No Outlier Test for THALLIUM

Dixon's Outlier Test for VANADIUM

Total N = 11

Number NDs = 0

Number Detects = 11

10% critical value: 0.517

5% critical value: 0.576

1% critical value: 0.679

Note: NDs excluded from Outlier Test

1. Data Value 22700 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.358

For 10% significance level, 22700 is not an outlier.

For 5% significance level, 22700 is not an outlier.

For 1% significance level, 22700 is not an outlier.

2. Data Value 2480 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.029

For 10% significance level, 2480 is not an outlier.

For 5% significance level, 2480 is not an outlier.

For 1% significance level, 2480 is not an outlier.

Dixon's Outlier Test for ZINC

Total N = 9

Number NDs = 0

Number Detects = 9

10% critical value: 0.441

5% critical value: 0.512

1% critical value: 0.635

Note: NDs excluded from Outlier Test

1. Data Value 27100 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.312

For 10% significance level, 27100 is not an outlier.

For 5% significance level, 27100 is not an outlier.

For 1% significance level, 27100 is not an outlier.

2. Data Value 3500 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.034

For 10% significance level, 3500 is not an outlier.

For 5% significance level, 3500 is not an outlier.

For 1% significance level, 3500 is not an outlier.

Appendix B4
Sediment Q-Q Plots

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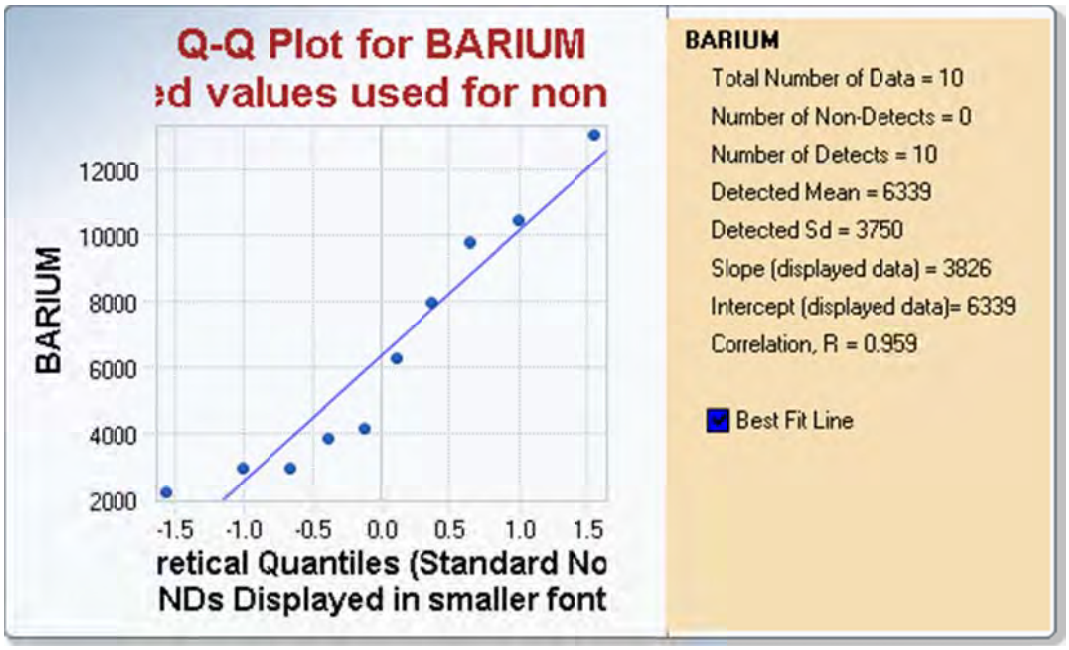
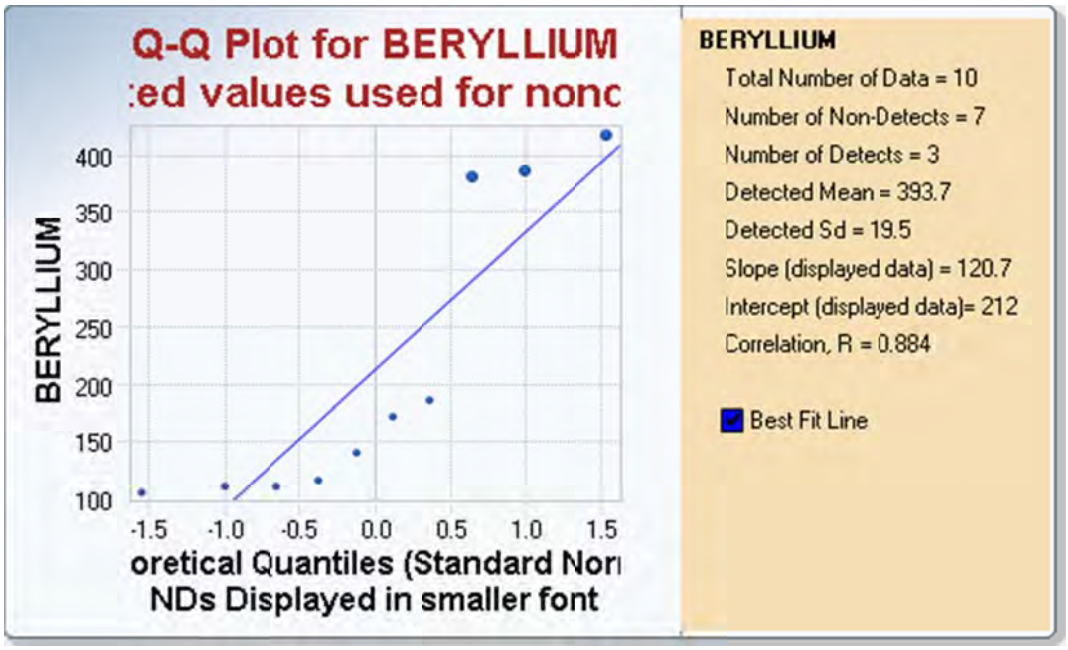
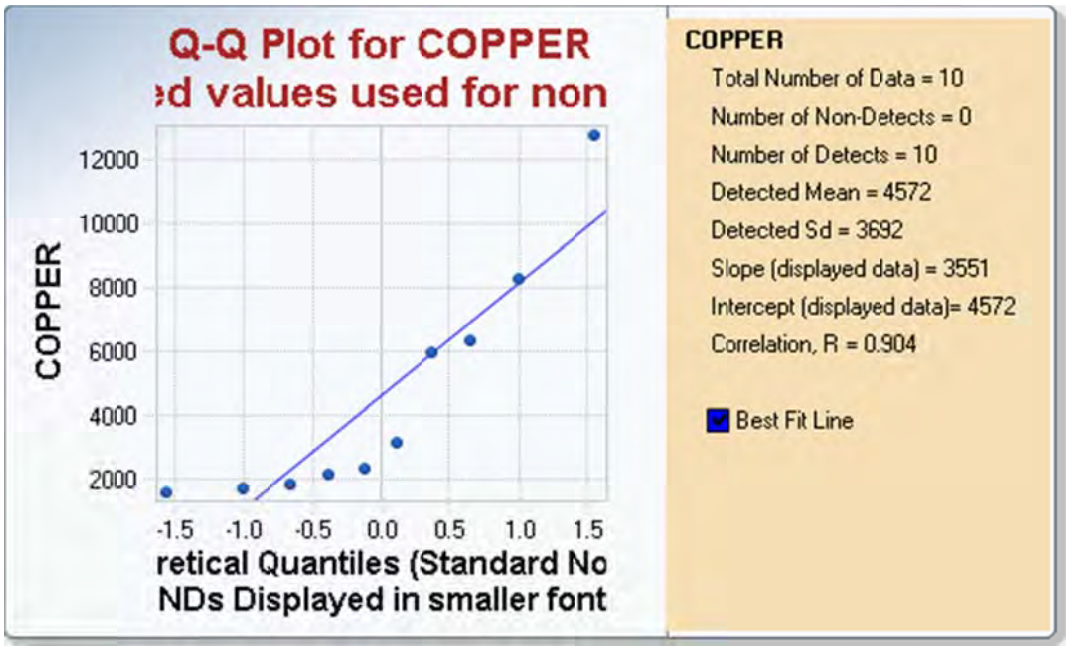
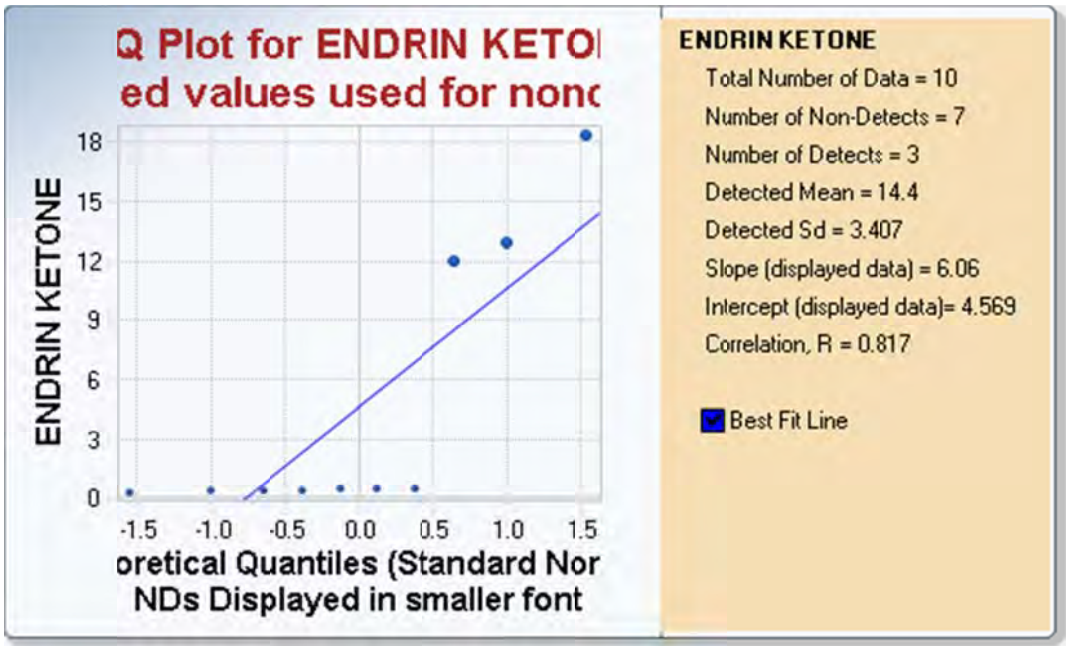
Q-Q Plots for Data Sets After Excluding Outliers Identified by ProUCL



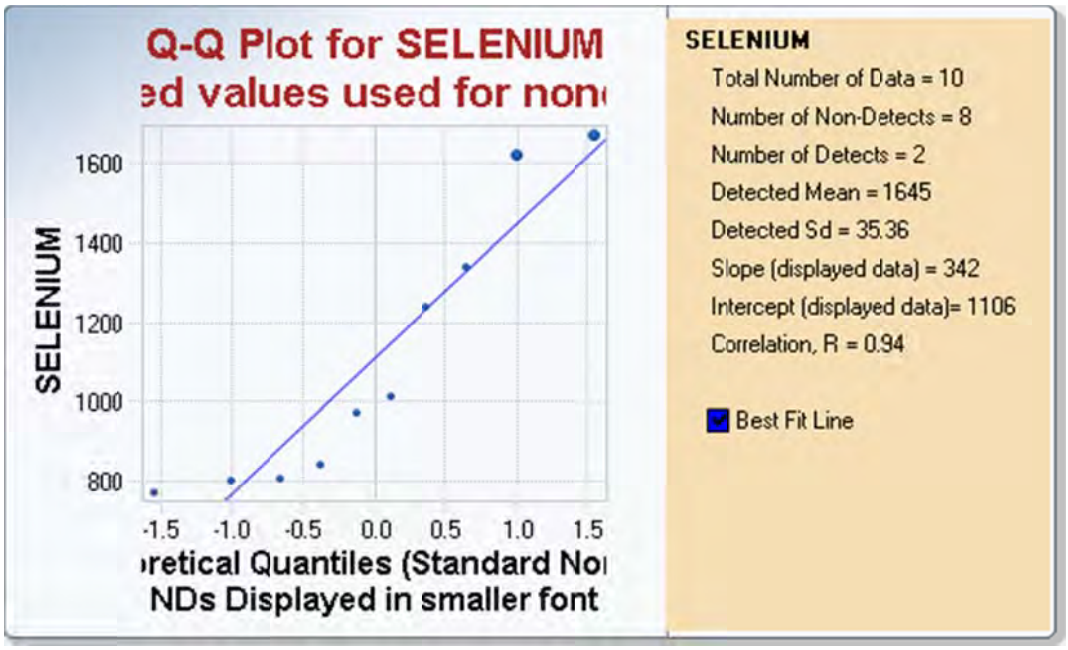


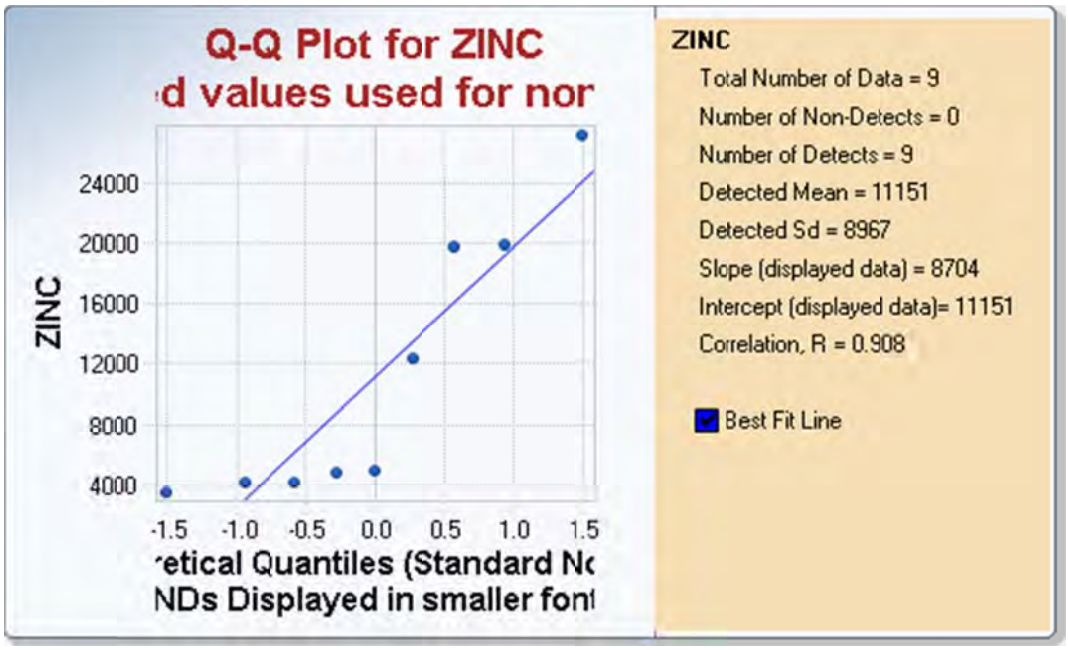
Q-Q Plots for Data Sets After Excluding Outliers Identified by ProUCL



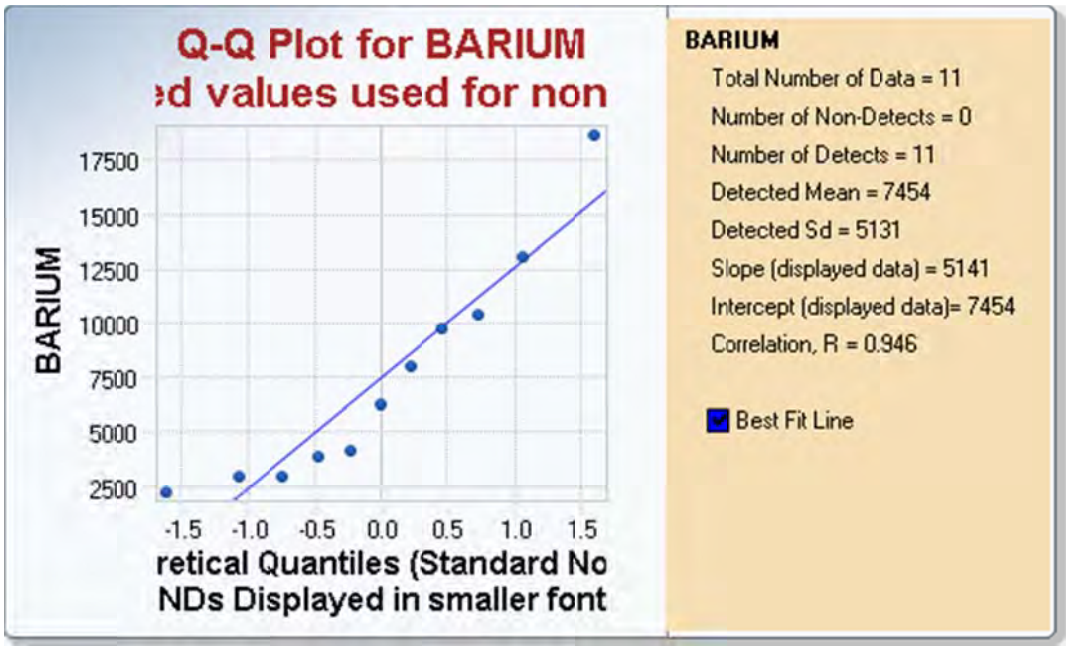


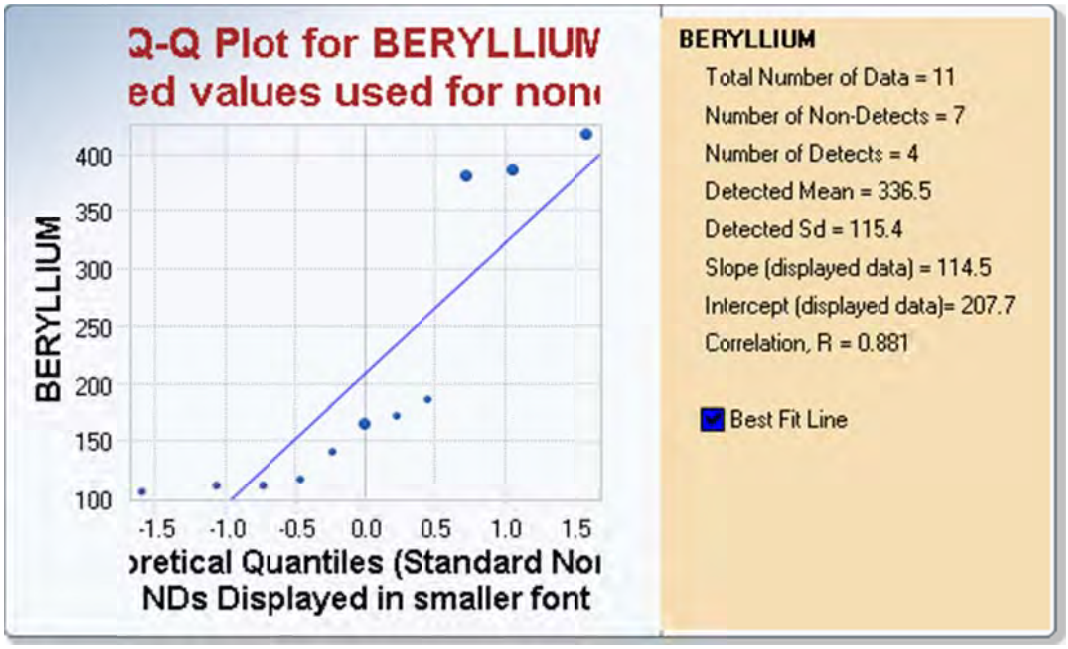
Q-Q Plots for Data Sets After Excluding Outliers Identified by ProUCL



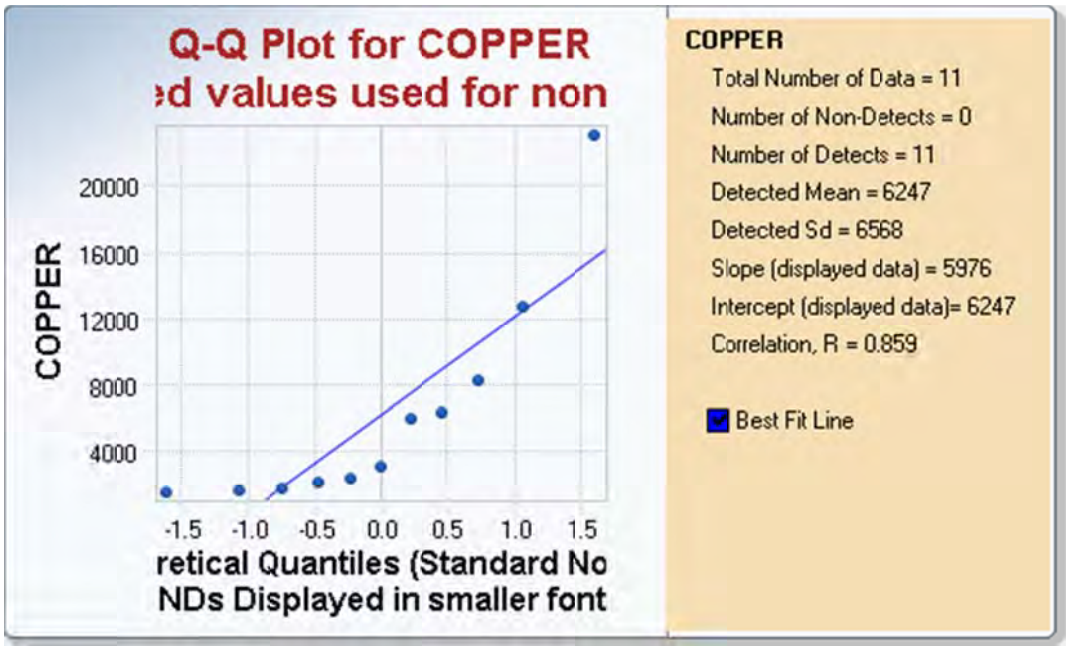


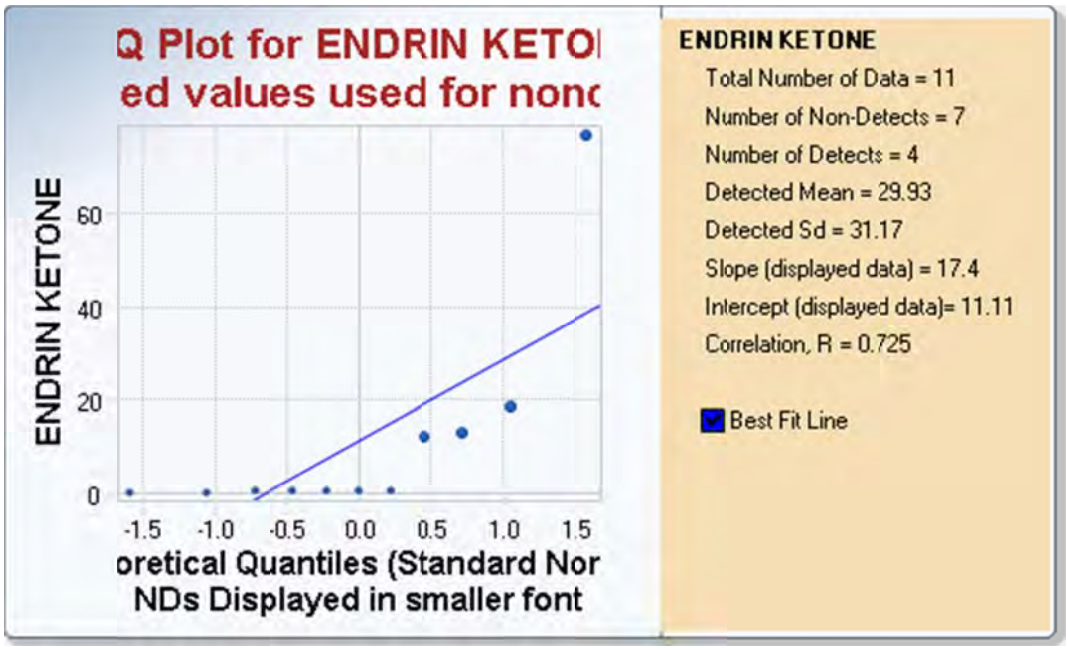
Q-Q Plots for Data Sets Including Outliers Identified by ProUCL



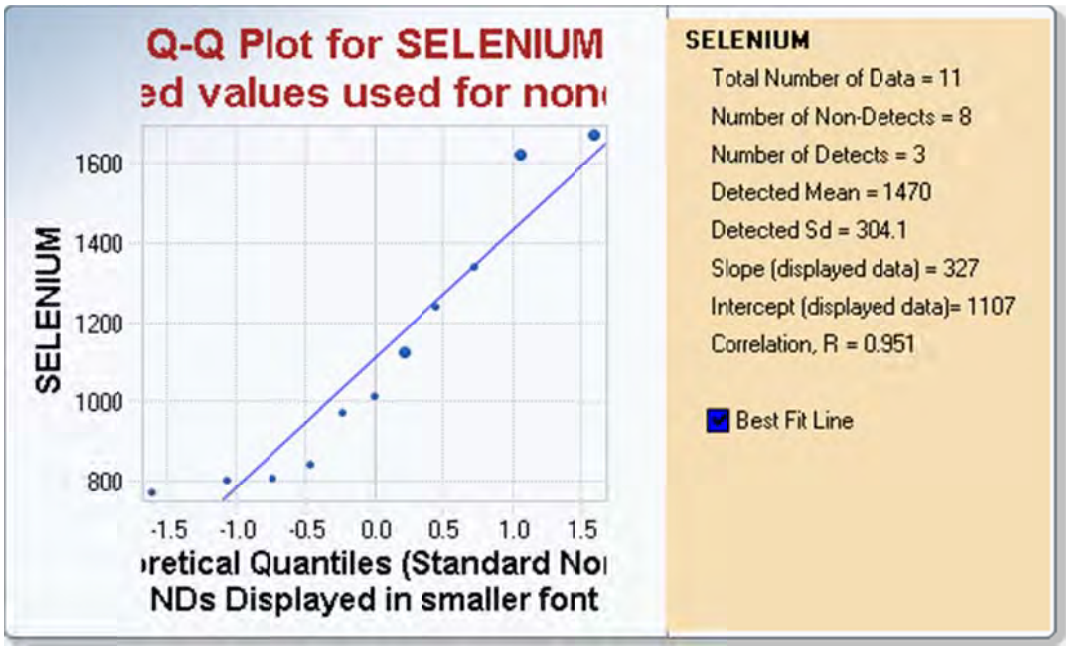


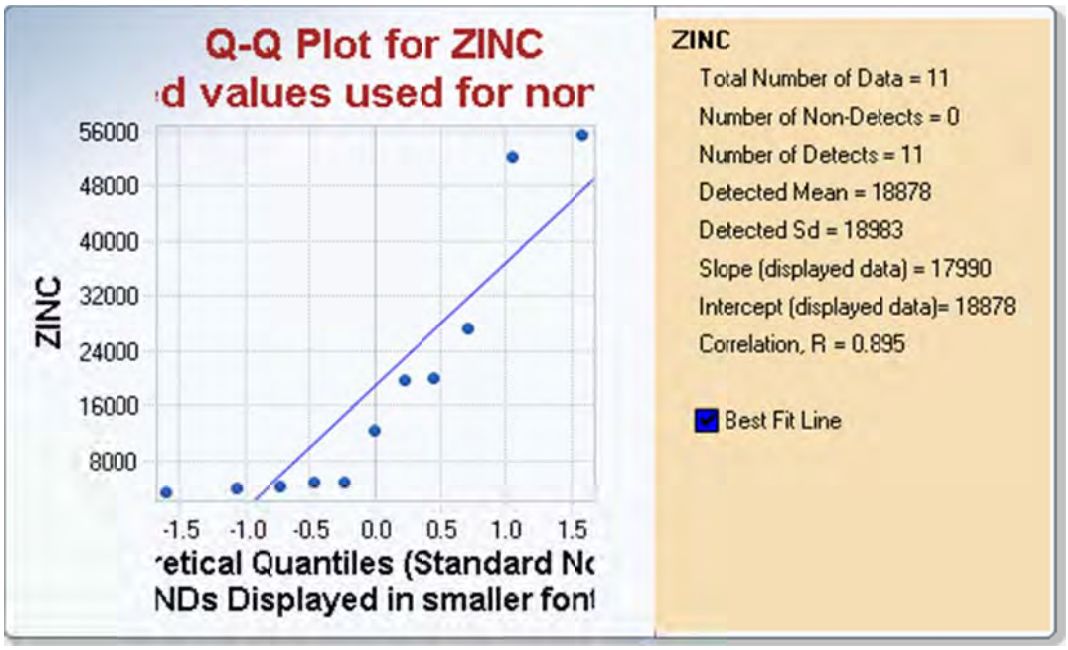
Q-Q Plots for Data Sets Including Outliers Identified by ProUCL



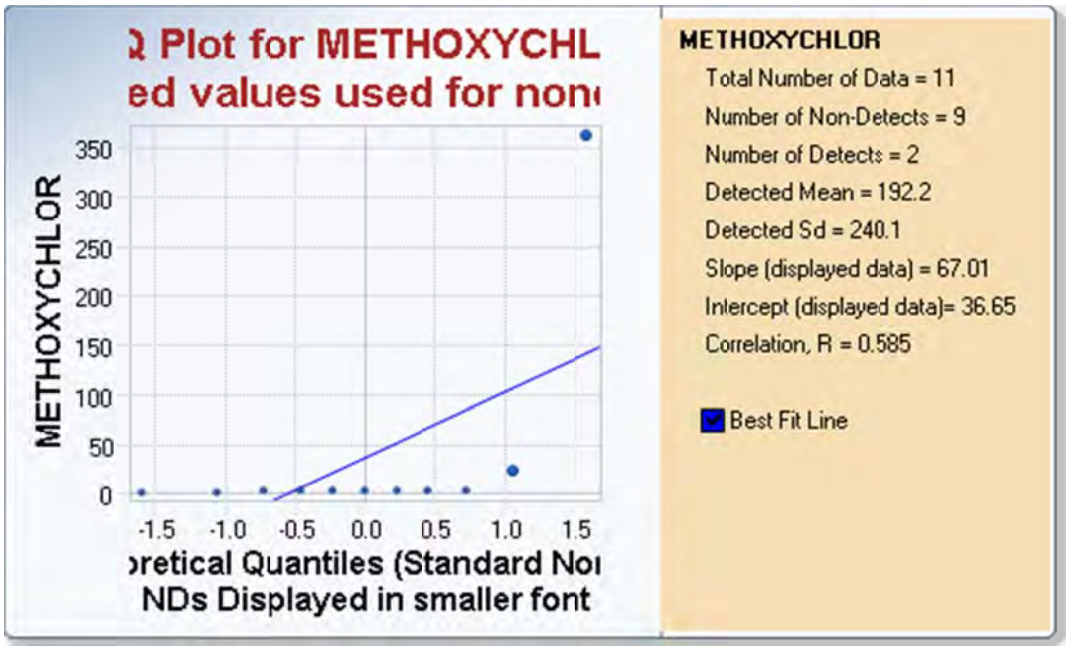


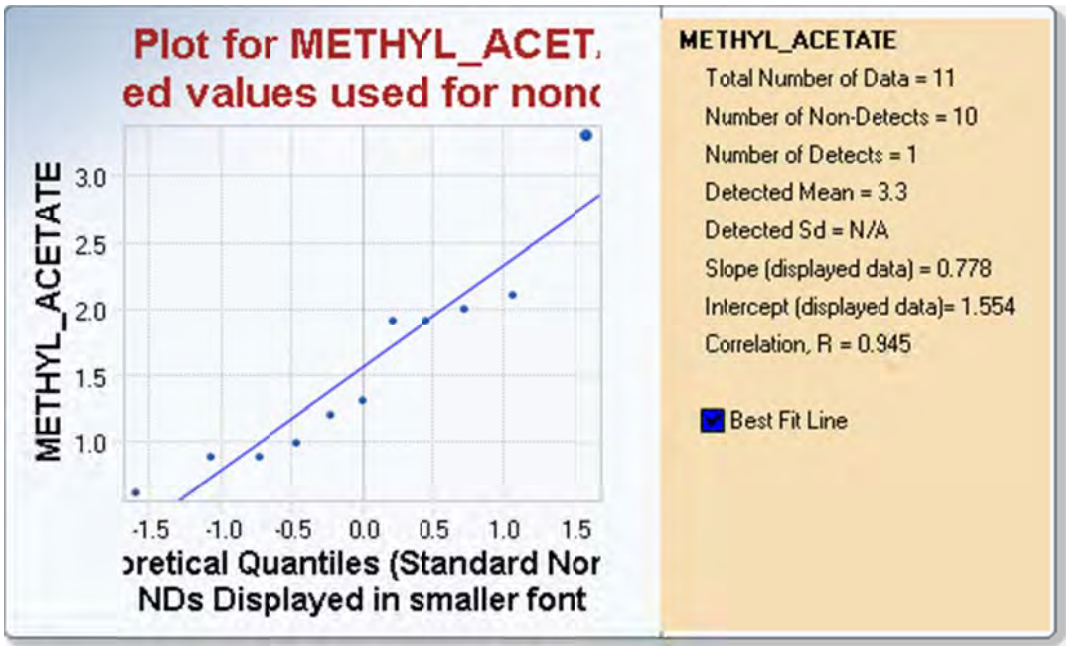
Q-Q Plots for Data Sets Including Outliers Identified by ProUCL





Q-Q Plots for Data Sets that ProUCL could not run Outlier Test





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Appendix C
Soil/Sediment Data

Soil

Appendix C1:	**Soil Data Summary**
Appendix C2:	**Soil Data with Outliers Highlighted**
Appendix C3:	**Soil Data Summary After Removing Outliers**
Appendix C4:	**Soil Data After Removing Outliers**
Appendix C5:	**ProUCL Output, Distribution Recommendations, Soil UCL Calculations, Outliers Removed**
Appendix C6:	**ProUCL Output Soil BTV Calculations, Outliers Removed**
Appendix C7:	**Soil Outliers Compared to USL**
Appendix C8:	**Soil Compounds with Three or Fewer Detected Concentrations**

Sediment

Appendix C9:	**Sediment Data Summary**
Appendix C10:	**Sediment Data with Outliers Highlighted**
Appendix C11:	**Sediment Data Summary After Removing Outliers**
Appendix C12:	**Sediment Data After Removing Outliers**
Appendix C13:	**ProUCL Output, Distribution Recommendations, Sediment UCL Calculations, Outliers Removed**
Appendix C14:	**ProUCL Output Sediment BTV Calculations, Outliers Removed**
Appendix C15:	**Sediment Outliers Compared to USL**
Appendix C16:	**Sediment Compounds with Three or Fewer Detected Concentrations**

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Appendix C1
Soil Data Summary

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Table C1
Summary Statistics of Soil Dataset Before Outlier Evaluation
MCRD Parris Island, South Carolina

Compound	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)
2,4'-D	1 / 66	20 - 20	20.0	11 - 22
4,4'-DDD	1 / 66	1.8 - 1.8	1.8	0.185 - 4.7
4,4'-DDE	4 / 66	2.4 - 12.1	7.2	0.183 - 5.4
4,4'-DDT	5 / 66	1.8 - 5.2	3.8	0.299 - 7.2
Alpha-Chlordane	20 / 66	0.862 - 280	17.6	0.145 - 0.65
Aluminum	66 / 66	127000 - 12100000	4196742.4	NA
Anthracene	2 / 66	77 - 590	333.5	37 - 80
Arsenic	49 / 66	250 - 3300	1083.3	60 - 669
Barium	66 / 66	681 - 32500	11213.3	NA
Benzaldehyde	2 / 66	360 - 800	580.0	180 - 210
Benzo(a)anthracene	3 / 66	150 - 2200	950.0	26 - 82
Benzo(a)pyrene	4 / 66	58 - 1400	539.5	36 - 63
Benzo(b)fluoranthene	4 / 66	89 - 1900	679.8	34 - 89
Benzo(g,h,i)perylene	2 / 66	220 - 1100	660.0	28 - 180
Benzo(k)fluoranthene	4 / 66	66 - 1500	564.0	42 - 81
Beryllium	42 / 66	60 - 288	128.6	10 - 92.3
Cadmium	5 / 66	66.5 - 320	161.6	10 - 73.5
Calcium	39 / 66	39900 - 43300000	2473220.5	970 - 15100
Carbazole	1 / 66	450 - 450	450.0	46 - 83
Carbon Disulfide	28 / 66	2 - 230	39.4	2 - 3.2
Chromium	66 / 66	484 - 14300	4550.4	NA
Chrysene	3 / 66	180 - 2500	1080.0	36 - 91
Cobalt	57 / 66	129 - 1200	358.1	10 - 138
Copper	66 / 66	320 - 4850	2298.9	NA
Dalapon	1 / 66	25 - 25	25.0	4 - 24
Dibenzo(a,h)anthracene	1 / 66	550 - 550	550.0	26 - 200
Dichlorodifluoromethane	2 / 66	1 - 2.8	1.9	0.62 - 3
Endosulfan Sulfate	3 / 66	2.42 - 13.6	6.8	0.224 - 6.8
Endrin	1 / 66	5.45 - 5.45	5.5	0.17 - 9.7
Endrin Aldehyde	1 / 66	6.53 - 6.53	6.5	0.234 - 12
Fluoranthene	4 / 66	84 - 5800	1766.0	44 - 98
Gamma-Chlordane	1 / 66	200 - 200	200.0	0.284 - 0.65
Heptachlor	1 / 66	1.03 - 1.03	1.0	1.68 - 18
Indeno(1,2,3-CD)pyrene	2 / 66	210 - 980	595.0	34 - 180
Iron	66 / 66	98300 - 11200000	2420019.7	NA
Lead	66 / 66	978 - 20400	4917.8	NA
Magnesium	66 / 66	6460 - 1040000	171507.0	NA
Manganese	66 / 66	1900 - 80100	15474.1	NA
Mercury	38 / 66	40 - 770	209.6	8.2 - 10
Methoxychlor	2 / 66	2.11 - 32.8	17.5	1.14 - 13
Methyl Acetate	2 / 66	1.9 - 3	2.5	0.65 - 1.1
Nickel	62 / 66	314 - 3600	1240.1	323 - 346
Phenanthrene	3 / 66	92 - 3200	1227.3	40 - 80
Potassium	63 / 66	19500 - 570000	91769.8	1580 - 13400
Pyrene	3 / 66	280 - 3500	1626.7	37 - 100
Selenium	21 / 66	150 - 1400	454.7	100 - 711
Silver	3 / 66	140 - 986	643.3	10 - 123
Sodium	17 / 66	40000 - 549000	98188.2	1390 - 44600
Thallium	3 / 66	379 - 682	482.3	20 - 417
Total DDD/DDE/DDT	6 / 66	2.93 - 12.5	8.2	0.299 - 7.2
Total PAH	4 / 66	142 - 25220	7642.8	340 - 460
Trichlorofluoromethane	5 / 66	2 - 7	4.4	0.43 - 2
Vanadium	66 / 66	323 - 23200	5842.8	NA
Zinc	28 / 66	1600 - 18000	5620.7	150 - 221

Notes:

NA = Not Applicable

µg/kg = Micrograms per kilograms

Soil data are provided in Appendix C2

Soil data that exclude outliers are provided in Appendix C4

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Appendix C2
Soil Data with Outliers Highlighted

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Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	2,4-D	D_2,4-D	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	ALPHA-CHLORDANE	D_ALPHA-CHLORDANE	ALUMINUM	D_ALUMINUM	ANTHRACENE	D_ANTHRACENE	ARSENIC	D_ARSENIC	BARIUM	D_BARIUM	BENZALDEHYDE	D_BENZALDEHYDE
BEA-BG-SB-SSB-01-03	18	0	1.8	1	8.9	1	1.8	1	0.54	0	4520000	1	67	0	1700	1	15200	1	0	0
BEA-BG-SB-SSB-02-03	18	0	0.5	0	0.58	0	0.78	0	0.54	0	10200000	1	68	0	1400	1	7700	1	0	0
BEA-BG-SB-SSB-03-03	20	0	0.56	0	0.64	0	0.86	0	0.6	0	3940000	1	75	0	90	0	16100	1	210	0
BEA-BG-SB-SSB-04-03	19	0	0.53	0	0.61	0	0.82	0	0.57	0	3600000	1	71	0	1500	1	6600	1	0	0
BEA-BG-SB-SSB-05-03	18	0	0.5	0	0.58	0	0.77	0	0.54	0	4440000	1	67	0	80	0	16200	1	0	0
BEA-BG-SB-SSB-06-03	17	0	4.7	0	5.4	0	7.2	0	280	1	746000	1	62	0	390	1	2900	1	0	0
BEA-BG-SB-SSB-07-03	20	0	0.54	0	0.62	0	0.83	0	0.58	0	4990000	1	72	0	1600	1	9600	1	0	0
BEA-BG-SB-SSB-08-03	17	0	0.47	0	0.54	0	0.73	0	0.51	0	6280000	1	63	0	520	1	13000	1	0	0
BEA-BG-SB-SSB-09-03	17	0	0.47	0	0.54	0	0.72	0	0.51	0	4670000	1	63	0	890	1	6200	1	0	0
BEA-BG-SB-SSB-10-03	18	0	0.51	0	0.58	0	0.78	0	0.54	0	2430000	1	68	0	250	1	1800	1	0	0
BEA-BG-SS-SSB-01-01	18	0	0.48	0	2.4	1	5.2	1	0.52	0	3040000	1	77	1	60	0	13000	1	0	0
BEA-BG-SS-SSB-02-01	17	0	0.48	0	0.55	0	0.74	0	0.52	0	4480000	1	64	0	1200	1	11100	1	0	0
BEA-BG-SS-SSB-03-01	18	0	0.48	0	0.56	0	0.75	0	1.5	1	4300000	1	65	0	1100	1	14400	1	0	0
BEA-BG-SS-SSB-03-01-D	17	0	0.48	0	0.56	0	0.74	0	0.52	0	3750000	1	64	0	890	1	13100	1	180	0
BEA-BG-SS-SSB-04-01	22	0	0.6	0	0.69	0	0.92	0	0.65	0	4430000	1	80	0	110	0	12000	1	360	1
BEA-BG-SS-SSB-04-01-D	20	0	0.54	0	0.62	0	0.83	0	0.58	0	3510000	1	72	0	520	1	11600	1	800	1
BEA-BG-SS-SSB-05-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	2960000	1	64	0	100	0	15400	1	0	0
BEA-BG-SS-SSB-06-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	2140000	1	65	0	500	1	9200	1	0	0
BEA-BG-SS-SSB-07-01	19	0	0.52	0	0.6	0	0.8	0	0.56	0	4150000	1	70	0	710	1	12100	1	0	0
BEA-BG-SS-SSB-08-01	18	0	0.49	0	0.57	0	0.76	0	0.53	0	9080000	1	66	0	1300	1	21200	1	0	0
BEA-BG-SS-SSB-09-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	4820000	1	65	0	610	1	9900	1	0	0
BEA-BG-SS-SSB-10-01	18	0	0.49	0	0.56	0	0.75	0	0.52	0	3780000	1	65	0	500	1	7800	1	0	0
SCS-01_0-1	12	0	0.206	0	0.204	0	0.333	0	0.161	0	4120000	1	590	1	640	0	15600	1	0	0
SCS-01_2-3	12	0	0.213	0	0.211	0	0.344	0	4.65	1	12100000	1	42	0	3300	1	26900	1	0	0
SCS-02_0-1	12	0	0.206	0	0.204	0	0.333	0	2.23	1	3180000	1	41	0	628	0	7280	1	0	0
SCS-02_2-3	13	0	0.223	0	0.221	0	0.361	0	2.5	1	10900000	1	44	0	2400	1	17100	1	0	0
SCS-03_0-1	12	0	0.208	0	0.206	0	0.336	0	0.163	0	6450000	1	41	0	1180	1	30400	1	0	0
SCS-03_2-3	12	0	0.216	0	0.213	0	0.348	0	0.169	0	4000000	1	43	0	1000	1	32500	1	0	0
SCS-04_0-1	12	0	0.208	0	5.41	1	4.87	1	0.163	0	5270000	1	41	0	1550	1	16800	1	0	0
SCS-04_2-3	12	0	0.213	0	0.211	0	0.344	0	0.166	0	2190000	1	42	0	910	1	5500	1	0	0
SCS-05_0-1	11	0	0.199	0	0.197	0	0.322	0	11.9	1	1530000	1	39	0	615	0	11600	1	0	0
SCS-05_2-3	12	0	0.213	0	0.211	0	0.344	0	2.36	1	1160000	1	42	0	1220	1	13000	1	0	0
SCS-06_0-1	11	0	0.201	0	0.199	0	0.325	0	0.157	0	5910000	1	40	0	818	1	26900	1	0	0
SCS-06_2-3	12	0	0.204	0	0.201	0	0.329	0	2.3	1	904000	1	40	0	679	1	4300	1	0	0
SCS-07_0-1	12	0	0.21	0	0.208	0	0.34	0	0.165	0	4630000	1	42	0	656	0	22400	1	0	0
SCS-07_2-3	12	0	0.21	0	0.208	0	0.34	0	0.165	0	4030000	1	42	0	880	1	16800	1	0	0
SCS-08_0-1	12	0	0.211	0	0.208	0	0.34	0	0.165	0	2100000	1	42	0	1310	1	15200	1	0	0
SCS-08_2-3	12	0	0.218	0	0.216	0	0.352	0	0.17	0	2870000	1	43	0	659	0	5800	1	0	0
SCS-09_0-1	11	0	0.201	0	0.199	0	0.325	0	0.157	0	2290000	1	40	0	1810	1	9190	1	0	0
SCS-09_2-3	11	0	0.199	0	0.197	0	0.322	0	2.56	1	2730000	1	39	0	1000	1	4000	1	0	0
SCS-10_0-1	12	0	0.215	0	0.213	0	0.348	0	0.168	0	4090000	1	43	0	1110	1	4430	1	0	0
SCS-10_2-3	13	0	0.223	0	0.221	0	0.361	0	0.175	0	9360000	1	44	0	2300	1	10300	1	0	0
SSA-01_0-1	20	1	0.235	0	0.232	0	0.379	0	2.45	1	6270000	1	47	0	968	1	12600	1	0	0
SSA-01_0-1-D	12	0	0.201	0	0.199	0	0.326	0	0.157	0	4670000	1	40	0	882	1	10500	1	0	0
SSA-01_2-3	11	0	0.185	0	0.183	0	0.299	0	0.145	0	3920000	1	37	0	892	1	4630	1	0	0
SSA-02_0-1	12	0	0.213	0	0.211	0	4.03	1	3.86	1	127000	1	42	0	669	0	681	1	0	0
SSA-02_0-1-D	12	0	0.215	0	0.213	0	0.348	0	0.168	0	2360000	1	43	0	720	1	3310	1	0	0
SSA-02_2-3	13	0	0.232	0	0.229	0	0.375	0	0.181	0	3610000	1	46	0	1230	1	4260	1	0	0
SSA-03_0-1	11	0	0.201	0	12.1	1	0.325	0	0.157	0	4610000	1	40	0	855	1	8260	1	0	0
SSA-03_0-1-D	11	0	0.201	0	0.199	0	0.326	0	0.158	0	4440000	1	40	0	1000	1	7550	1	0	0
SSA-03_2-3	11	0	0.197	0	0.195	0	0.318	0	0.154	0	2220000	1	39	0	608	1	3710	1	0	0
SSA-04_0-1	11	0	0.201	0	0.199	0	0.325	0	0.862	1	2830000	1	40	0	594	0	5780	1	0	0
SSA-04_0-1-D	11	0	0.201	0	0.199	0	0.326	0	0.158	0	4960000	1	40	0	605	0	16100	1	0	0
SSA-04_2-3	12	0	0.204	0	0.201	0	0.329	0	1.49	1	3550000	1	40	0	721	1	5400	1	0	0
SSA-05_0-1	12	0	0.204	0	0.201	0	0.329	0	0.159	0	5180000	1	40	0	873	1	18600	1	0	0
SSA-05_2-3	11	0	0.197	0	0.195	0	0.319	0	9.21	1	4480000	1	39	0	1790	1	10700	1	0	0
SSA-06_0-1	12	0	0.211	0	0.208	0	2.93	1	1.97	1	5920000	1	42	0	1020	1	11500	1	0	0
SSA-06_2-3	12	0	0.21	0	0.208	0	0.34	0	3.75	1	4780000	1	42	0	604	0	11100	1	0	0
SSA-07_0-1	11	0	0.193	0	0.191	0	0.312	0	0.151	0	1420000	1	38	0	680	1	6440	1	0	0
SSA-07_2-3	11	0	0.195	0	0.193	0	0.315	0	4.33	1	958000	1	39	0	593	0	2940	1	0	0
SSA-08_0-1	12	0	0.203	0	0.201	0	0.329	0	0.159	0	4880000	1	40	0	1290	1	13400	1	0	0
SSA-08_2-3	12	0	0.208	0	0.206	0	0.336	0	4.44	1	5440000	1	41	0	995	1	12700	1	0	0
SSA-09_0-1	12	0	0.204	0	0.201	0	0.329	0	0.159	0	4720000	1	40	0	844	1	15400	1	0	0
SSA-09_2-3	12	0	0.204	0	0.201	0	0.329	0	5.71	1	2100000	1	40	0	624	0	5040	1	0	0
SSA-10_0-1	11	0	0.199	0	0.197	0	0.322	0	0.156	0	4610000	1	39	0	606	0	3700	1	0	0
SSA-10_2-3	11	0	0.199	0	0.197	0	0.322	0	3.14	1	2860000	1	39	0	666	1	3680	1	0	0

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	BENZO(A)ANTHRACENE	D_BENZO(A)ANTHRACENE	BENZO(A)PYRENE	D_BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	D_BENZO(B)FLUORANTHENE	BENZO(G,H,I)PERYLENE	D_BENZO(G,H,I)PERYLENE	BENZO(K)FLUORANTHENE	D_BENZO(K)FLUORANTHENE
BEA-BG-SB-SSB-01-03	150	1	160	1	190	1	150	0	170	1
BEA-BG-SB-SSB-02-03	69	0	53	0	74	0	150	0	68	0
BEA-BG-SB-SSB-03-03	76	0	58	0	82	0	170	0	76	0
BEA-BG-SB-SSB-04-03	72	0	56	0	79	0	160	0	72	0
BEA-BG-SB-SSB-05-03	68	0	52	0	74	0	150	0	68	0
BEA-BG-SB-SSB-06-03	64	0	49	0	69	0	140	0	63	0
BEA-BG-SB-SSB-07-03	74	0	56	0	80	0	160	0	73	0
BEA-BG-SB-SSB-08-03	64	0	49	0	70	0	140	0	64	0
BEA-BG-SB-SSB-09-03	64	0	49	0	70	0	140	0	64	0
BEA-BG-SB-SSB-10-03	69	0	53	0	75	0	150	0	68	0
BEA-BG-SS-SSB-01-01	500	1	540	1	540	1	220	1	520	1
BEA-BG-SS-SSB-02-01	65	0	58	1	89	1	140	0	66	1
BEA-BG-SS-SSB-03-01	66	0	51	0	72	0	140	0	66	0
BEA-BG-SS-SSB-03-01-D	66	0	50	0	71	0	140	0	65	0
BEA-BG-SS-SSB-04-01	82	0	63	0	89	0	180	0	81	0
BEA-BG-SS-SSB-04-01-D	74	0	56	0	80	0	160	0	73	0
BEA-BG-SS-SSB-05-01	66	0	50	0	71	0	140	0	65	0
BEA-BG-SS-SSB-06-01	66	0	50	0	71	0	140	0	65	0
BEA-BG-SS-SSB-07-01	71	0	55	0	77	0	160	0	71	0
BEA-BG-SS-SSB-08-01	67	0	52	0	73	0	150	0	67	0
BEA-BG-SS-SSB-09-01	66	0	51	0	71	0	140	0	66	0
BEA-BG-SS-SSB-10-01	66	0	51	0	72	0	140	0	66	0
SCS-01_0-1	2200	1	1400	1	1900	1	1100	1	1500	1
SCS-01_2-3	30	0	42	0	39	0	32	0	48	0
SCS-02_0-1	29	0	40	0	37	0	31	0	47	0
SCS-02_2-3	31	0	44	0	41	0	34	0	51	0
SCS-03_0-1	29	0	41	0	38	0	31	0	47	0
SCS-03_2-3	30	0	42	0	39	0	33	0	49	0
SCS-04_0-1	29	0	41	0	38	0	31	0	47	0
SCS-04_2-3	30	0	42	0	39	0	32	0	48	0
SCS-05_0-1	28	0	39	0	36	0	30	0	45	0
SCS-05_2-3	30	0	42	0	39	0	32	0	48	0
SCS-06_0-1	28	0	40	0	37	0	30	0	46	0
SCS-06_2-3	28	0	40	0	37	0	31	0	46	0
SCS-07_0-1	29	0	41	0	38	0	32	0	48	0
SCS-07_2-3	29	0	41	0	38	0	32	0	48	0
SCS-08_0-1	29	0	41	0	38	0	32	0	48	0
SCS-08_2-3	31	0	43	0	40	0	33	0	50	0
SCS-09_0-1	28	0	40	0	37	0	30	0	46	0
SCS-09_2-3	28	0	39	0	36	0	30	0	45	0
SCS-10_0-1	30	0	42	0	39	0	33	0	49	0
SCS-10_2-3	31	0	44	0	41	0	34	0	51	0
SSA-01_0-1	33	0	46	0	43	0	35	0	53	0
SSA-01_0-1-D	28	0	40	0	37	0	30	0	46	0
SSA-01_2-3	26	0	36	0	34	0	28	0	42	0
SSA-02_0-1	30	0	42	0	39	0	32	0	48	0
SSA-02_0-1-D	30	0	42	0	39	0	33	0	49	0
SSA-02_2-3	32	0	45	0	42	0	35	0	53	0
SSA-03_0-1	28	0	39	0	37	0	30	0	46	0
SSA-03_0-1-D	28	0	40	0	37	0	30	0	46	0
SSA-03_2-3	28	0	39	0	36	0	30	0	45	0
SSA-04_0-1	28	0	40	0	37	0	30	0	46	0
SSA-04_0-1-D	28	0	39	0	37	0	30	0	46	0
SSA-04_2-3	28	0	40	0	37	0	31	0	46	0
SSA-05_0-1	28	0	40	0	37	0	31	0	46	0
SSA-05_2-3	28	0	39	0	36	0	30	0	45	0
SSA-06_0-1	29	0	41	0	38	0	32	0	48	0
SSA-06_2-3	29	0	41	0	38	0	32	0	48	0
SSA-07_0-1	27	0	38	0	35	0	29	0	44	0
SSA-07_2-3	27	0	38	0	35	0	29	0	44	0
SSA-08_0-1	28	0	40	0	37	0	31	0	46	0
SSA-08_2-3	29	0	41	0	38	0	31	0	47	0
SSA-09_0-1	28	0	40	0	37	0	31	0	46	0
SSA-09_2-3	28	0	40	0	37	0	31	0	46	0
SSA-10_0-1	28	0	39	0	36	0	30	0	45	0
SSA-10_2-3	28	0	39	0	36	0	30	0	45	0

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	BERYLLIUM	D_BERYLLIUM	CADMIUM	D_CADMIUM	CALCIUM	D_CALCIUM	CARBAZOLE	D_CARBAZOLE	CARBON DISULFIDE	D_CARBON DISULFIDE	CHROMIUM	D_CHROMIUM	CHRYSENE	D_CHRYSENE	COBALT	D_COBALT	COPPER	D_COPPER
BEA-BG-SB-SSB-01-03	180	1	10	0	1390000	1	69	0	2	0	7200	1	180	1	330	1	1800	1
BEA-BG-SB-SSB-02-03	90	1	10	0	1080000	1	70	0	2	0	6400	1	76	0	590	1	890	1
BEA-BG-SB-SSB-03-03	120	1	10	0	446000	1	77	0	2	0	4800	1	85	0	340	1	1300	1
BEA-BG-SB-SSB-04-03	10	0	10	0	267000	1	74	0	2	0	4400	1	81	0	190	1	720	1
BEA-BG-SB-SSB-05-03	110	1	10	0	467000	1	70	0	2	0	6600	1	76	0	280	1	1200	1
BEA-BG-SB-SSB-06-03	60	1	10	0	734000	1	65	0	2	0	2600	1	71	0	200	1	570	1
BEA-BG-SB-SSB-07-03	270	1	10	0	5260000	1	75	0	2	0	10100	1	82	0	1000	1	1500	1
BEA-BG-SB-SSB-08-03	10	0	10	0	232000	1	65	0	2	0	7400	1	72	0	570	1	830	1
BEA-BG-SB-SSB-09-03	10	0	10	0	1240	0	65	0	2	0	5900	1	71	0	240	1	740	1
BEA-BG-SB-SSB-10-03	10	0	10	0	970	0	70	0	2	0	2700	1	77	0	10	0	320	1
BEA-BG-SS-SSB-01-01	10	0	240	1	1070000	1	67	0	2	0	4500	1	560	1	220	1	3700	1
BEA-BG-SS-SSB-02-01	150	1	320	1	43300000	1	66	0	2	0	7200	1	72	0	1200	1	3800	1
BEA-BG-SS-SSB-03-01	100	1	110	1	9810000	1	67	0	2	0	5400	1	74	0	450	1	1900	1
BEA-BG-SS-SSB-03-01-D	90	1	10	0	1290000	1	67	0	2	0	5500	1	73	0	400	1	2000	1
BEA-BG-SS-SSB-04-01	10	0	10	0	623000	1	83	0	2	0	4800	1	91	0	280	1	2100	1
BEA-BG-SS-SSB-04-01-D	80	1	10	0	521000	1	75	0	2	0	3900	1	82	0	270	1	2200	1
BEA-BG-SS-SSB-05-01	80	1	10	0	202000	1	67	0	2	0	4100	1	73	0	240	1	2300	1
BEA-BG-SS-SSB-06-01	100	1	10	0	756000	1	67	0	2	0	3900	1	73	0	260	1	2400	1
BEA-BG-SS-SSB-07-01	180	1	10	0	21000000	1	72	0	2	0	7400	1	79	0	620	1	1800	1
BEA-BG-SS-SSB-08-01	120	1	10	0	487000	1	68	0	2	0	7500	1	75	0	810	1	1500	1
BEA-BG-SS-SSB-09-01	80	1	10	0	75300	1	67	0	2	0	4800	1	73	0	270	1	790	1
BEA-BG-SS-SSB-10-01	70	1	10	0	39900	1	68	0	2	0	3400	1	74	0	220	1	850	1
SCS-01_0-1	110	1	66.2	0	486000	1	450	1	2.1	0	2310	1	2500	1	155	1	1450	1
SCS-01_2-3	190	1	68.2	0	1000000	1	53	0	72	1	11800	1	41	0	1000	1	2900	1
SCS-02_0-1	86.7	0	65	0	72400	1	51	0	2.2	1	2580	1	40	0	314	1	1340	1
SCS-02_2-3	160	1	71.6	0	14700	0	56	0	100	1	14300	1	43	0	540	1	2200	1
SCS-03_0-1	288	1	63.9	0	186000	1	52	0	2.1	0	3700	1	40	0	490	1	3440	1
SCS-03_2-3	160	1	67.2	0	13800	0	54	0	54	1	3200	1	42	0	850	1	2300	1
SCS-04_0-1	86.6	0	64.9	0	387000	1	52	0	2	0	6290	1	40	0	314	1	4510	1
SCS-04_2-3	90.3	0	67.7	0	13900	0	53	0	230	1	2400	1	41	0	410	1	1900	1
SCS-05_0-1	106	1	63.6	0	13000	0	50	0	5.2	1	1740	1	38	0	276	1	2140	1
SCS-05_2-3	159	1	68.3	0	14000	0	53	0	80	1	2630	1	41	0	182	1	1890	1
SCS-06_0-1	265	1	63.7	0	376000	1	50	0	11	1	3670	1	39	0	403	1	2850	1
SCS-06_2-3	83.6	1	62.7	0	12900	0	51	0	100	1	1990	1	39	0	251	1	3630	1
SCS-07_0-1	113	1	67.9	0	487000	1	52	0	2.9	0	3330	1	41	0	419	1	3030	1
SCS-07_2-3	150	1	67.9	0	406000	1	52	0	3.1	1	3200	1	41	0	500	1	2700	1
SCS-08_0-1	90.2	0	67.6	0	525000	1	52	0	2.9	0	3380	1	41	0	135	0	3810	1
SCS-08_2-3	90.9	0	68.2	0	346000	1	54	0	76	1	3300	1	42	0	180	1	1700	1
SCS-09_0-1	87	0	65.3	0	276000	1	50	0	3.2	0	8030	1	39	0	131	0	4850	1
SCS-09_2-3	86.1	0	64.6	0	13200	0	50	0	2.8	0	2900	1	38	0	180	1	1600	1
SCS-10_0-1	90.7	0	68	0	131000	1	54	0	8	1	3630	1	42	0	136	0	1330	1
SCS-10_2-3	120	1	67.1	0	13800	0	56	0	89	1	13800	1	43	0	450	1	2300	1
SSA-01_0-1	135	1	73.5	0	15100	0	58	0	6	1	4490	1	45	0	306	1	2770	1
SSA-01_0-1-D	113	1	61.6	0	12600	0	50	0	5.8	1	4580	1	39	0	277	1	2050	1
SSA-01_2-3	73.6	0	55.2	0	11300	0	46	0	2.2	0	4460	1	36	0	212	1	3470	1
SSA-02_0-1	92.3	0	69.2	0	14200	0	53	0	8.5	1	484	1	41	0	138	0	2680	1
SSA-02_0-1-D	155	1	66.5	1	13600	0	54	0	11	1	2580	1	42	0	133	0	2590	1
SSA-02_2-3	179	1	71.7	1	14700	0	58	0	63	1	3500	1	45	0	239	1	3500	1
SSA-03_0-1	103	1	61.8	0	12700	0	50	0	2	0	3920	1	39	0	196	1	3210	1
SSA-03_0-1-D	82.6	1	62	0	12700	0	50	0	2.5	0	4750	1	39	0	196	1	2640	1
SSA-03_2-3	78.5	0	58.9	0	12100	0	49	0	2.8	1	3730	1	38	0	157	1	3950	1
SSA-04_0-1	81.9	0	61.4	0	12600	0	50	0	12	1	2800	1	39	0	133	1	2840	1
SSA-04_0-1-D	104	1	62.6	0	12800	0	50	0	2.7	0	2720	1	39	0	125	0	2460	1
SSA-04_2-3	84.8	1	63.6	0	13000	0	51	0	3.8	1	4710	1	39	0	276	1	3230	1
SSA-05_0-1	131	1	65.5	0	389000	1	51	0	2.2	0	3020	1	39	0	131	1	3250	1
SSA-05_2-3	100	1	60.1	0	12300	0	49	0	8.3	1	5360	1	38	0	410	1	3000	1
SSA-06_0-1	94.1	1	62.8	0	379000	1	52	0	2	1	4450	1	41	0	356	1	2560	1
SSA-06_2-3	83.4	0	62.5	0	216000	1	52	0	3.9	1	3620	1	41	0	261	1	1790	1
SSA-07_0-1	80	0	60	0	12300	0	48	0	3.7	1	2110	1	37	0	150	1	2200	1
SSA-07_2-3	81.8	0	61.4	0	12600	0	49	0	19	1	1880	1	38	0	123	0	2320	1
SSA-08_0-1	102	1	61	0	495000	1	51	0	2.1	0	3490	1	39	0	335	1	2280	1
SSA-08_2-3	93.3	1	62.2	0	252000	1	52	0	2	0	3620	1	40	0	363	1	1980	1
SSA-09_0-1	141	1	64.9	0	757000	1	51	0	2.9	0	2720	1	39	0	260	1	2870	1
SSA-09_2-3	86.1	0	64.6	0	13200	0	51	0	49	1	2110	1	39	0	129	1	2890	1
SSA-10_0-1	83.6	0	62.7	0	239000	1	50	0	2.8	0	2570	1	38	0	125	0	2230	1
SSA-10_2-3	79.6	0	59.7	0	12200	0	50	0	74	1	3970	1	38	0	129	1	1890	1

Notes:
Units are microgram per kilogram (µg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	DALAPON	D_DALAPON	DIBENZO(A,H)ANTHRACENE	D_DIBENZO(A,H)ANTHRACENE	DICHLORODIFLUOROMETHANE	D_DICHLORODIFLUOROMETHANE	ENDOSULFAN SULFATE	D_ENDOSULFAN SULFATE	ENDRIN	D_ENDRIN	ENDRIN ALDEHYDE	D_ENDRIN ALDEHYDE
BEA-BG-SB-SSB-01-03	20	0	160	0	2	0	0.73	0	1	0	1.3	0
BEA-BG-SB-SSB-02-03	20	0	160	0	2	0	0.74	0	1	0	1.4	0
BEA-BG-SB-SSB-03-03	22	0	180	0	2	0	0.82	0	1.2	0	1.5	0
BEA-BG-SB-SSB-04-03	21	0	170	0	2	0	0.78	0	1.1	0	1.4	0
BEA-BG-SB-SSB-05-03	20	0	160	0	2	0	0.73	0	1	0	1.4	0
BEA-BG-SB-SSB-06-03	18	0	150	0	2	0	6.8	0	9.7	0	12	0
BEA-BG-SB-SSB-07-03	21	0	180	0	2	0	0.79	0	1.1	0	1.4	0
BEA-BG-SB-SSB-08-03	18	0	150	0	2	0	0.69	0	0.98	0	1.3	0
BEA-BG-SB-SSB-09-03	18	0	150	0	2	0	0.69	0	0.98	0	1.3	0
BEA-BG-SB-SSB-10-03	20	0	160	0	2	0	0.74	0	1	0	1.4	0
BEA-BG-SS-SSB-01-01	19	0	160	0	2	0	0.71	0	1	0	1.3	0
BEA-BG-SS-SSB-02-01	19	0	160	0	2	0	0.7	0	0.99	0	1.3	0
BEA-BG-SS-SSB-03-01	19	0	160	0	2	0	0.71	0	1	0	1.3	0
BEA-BG-SS-SSB-03-01-D	19	0	160	0	2	0	0.7	0	1	0	1.3	0
BEA-BG-SS-SSB-04-01	24	0	200	0	3	0	0.88	0	1.2	0	1.6	0
BEA-BG-SS-SSB-04-01-D	21	0	180	0	2	0	0.79	0	1.1	0	1.4	0
BEA-BG-SS-SSB-05-01	19	0	160	0	2	0	0.7	0	1	0	1.3	0
BEA-BG-SS-SSB-06-01	25	1	160	0	2	0	0.7	0	1	0	1.3	0
BEA-BG-SS-SSB-07-01	20	0	170	0	2	0	0.76	0	1.1	0	1.4	0
BEA-BG-SS-SSB-08-01	19	0	160	0	2	0	0.72	0	1	0	1.3	0
BEA-BG-SS-SSB-09-01	19	0	160	0	2	0	0.71	0	1	0	1.3	0
BEA-BG-SS-SSB-10-01	19	0	160	0	2	0	0.71	0	1	0	1.3	0
SCS-01_0-1	4.5	0	550	1	1	1	0.249	0	0.189	0	0.261	0
SCS-01_2-3	4.6	0	29	0	0.83	0	0.257	0	0.195	0	0.269	0
SCS-02_0-1	4.5	0	28	0	0.62	0	0.249	0	0.189	0	0.261	0
SCS-02_2-3	4.9	0	31	0	1.1	0	0.27	0	0.205	0	0.283	0
SCS-03_0-1	4.5	0	29	0	0.72	0	0.251	0	0.191	0	0.263	0
SCS-03_2-3	4.7	0	30	0	0.73	0	0.26	0	0.197	0	0.273	0
SCS-04_0-1	4.5	0	29	0	0.68	0	2.42	1	0.191	0	0.263	0
SCS-04_2-3	4.6	0	29	0	0.98	0	0.257	0	0.195	0	0.269	0
SCS-05_0-1	4.3	0	27	0	0.76	0	0.241	0	0.182	0	0.252	0
SCS-05_2-3	4.6	0	29	0	0.98	0	0.257	0	0.195	0	0.27	0
SCS-06_0-1	4.4	0	28	0	0.94	0	4.47	1	0.184	0	0.255	0
SCS-06_2-3	4.4	0	28	0	0.86	0	0.246	0	0.186	0	0.258	0
SCS-07_0-1	4.6	0	29	0	0.97	0	0.254	0	0.193	0	0.266	0
SCS-07_2-3	4.6	0	29	0	1	0	0.254	0	0.193	0	0.266	0
SCS-08_0-1	4.6	0	29	0	0.97	0	0.254	0	0.193	0	0.266	0
SCS-08_2-3	4.8	0	30	0	0.86	0	0.263	0	0.2	0	0.276	0
SCS-09_0-1	4.4	0	28	0	1.1	0	0.243	0	0.184	0	0.255	0
SCS-09_2-3	4.3	0	27	0	0.96	0	0.24	0	0.182	0	0.252	0
SCS-10_0-1	4.7	0	30	0	0.94	0	0.26	0	0.197	0	0.273	0
SCS-10_2-3	4.9	0	31	0	0.83	0	0.27	0	0.205	0	0.283	0
SSA-01_0-1	5.1	0	32	0	0.94	0	0.284	0	0.215	0	0.297	0
SSA-01_0-1-D	4.4	0	28	0	0.91	0	0.243	0	0.184	0	0.255	0
SSA-01_2-3	4	0	26	0	0.74	0	0.224	0	0.17	0	0.234	0
SSA-02_0-1	4.6	0	29	0	0.75	0	0.257	0	0.195	0	0.269	0
SSA-02_0-1-D	4.7	0	30	0	0.81	0	0.26	0	0.197	0	0.273	0
SSA-02_2-3	5	0	32	0	0.74	0	0.28	0	0.212	0	0.293	0
SSA-03_0-1	4.4	0	28	0	0.67	0	13.6	1	5.45	1	6.53	1
SSA-03_0-1-D	4.4	0	28	0	0.85	0	0.243	0	0.185	0	0.255	0
SSA-03_2-3	4.3	0	27	0	0.74	0	0.238	0	0.18	0	0.249	0
SSA-04_0-1	4.4	0	28	0	2.8	1	0.243	0	0.184	0	0.255	0
SSA-04_0-1-D	4.4	0	28	0	0.93	0	0.243	0	0.185	0	0.255	0
SSA-04_2-3	4.4	0	28	0	0.69	0	0.246	0	0.187	0	0.258	0
SSA-05_0-1	4.4	0	28	0	0.75	0	0.246	0	0.187	0	0.258	0
SSA-05_2-3	4.3	0	27	0	0.78	0	0.238	0	0.181	0	0.249	0
SSA-06_0-1	4.6	0	29	0	0.67	0	0.254	0	0.193	0	0.266	0
SSA-06_2-3	4.6	0	29	0	0.67	0	0.254	0	0.193	0	0.266	0
SSA-07_0-1	4.2	0	27	0	0.77	0	0.233	0	0.177	0	0.244	0
SSA-07_2-3	4.3	0	27	0	0.8	0	0.236	0	0.179	0	0.247	0
SSA-08_0-1	4.4	0	28	0	0.71	0	0.246	0	0.186	0	0.257	0
SSA-08_2-3	4.5	0	29	0	0.68	0	0.251	0	0.191	0	0.263	0
SSA-09_0-1	4.4	0	28	0	0.98	0	0.246	0	0.186	0	0.258	0
SSA-09_2-3	4.4	0	28	0	0.93	0	0.246	0	0.186	0	0.258	0
SSA-10_0-1	4.3	0	27	0	0.95	0	0.24	0	0.182	0	0.252	0
SSA-10_2-3	4.3	0	27	0	0.92	0	0.24	0	0.182	0	0.252	0

Notes:
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Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	FLUORANTHENE	D_FLUORANTHENE	GAMMA-CHLORDANE	D_GAMMA-CHLORDANE	HEPTACHLOR	D_HEPTACHLOR	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE	IRON	D_IRON	LEAD	D_LEAD	MAGNESIUM	D_MAGNESIUM	MANGANESE	D_MANGANESE	MERCURY
BEA-BG-SB-SSB-01-03	260	1	0.54	0	2	0	150	0	4,280,000	1	15500	1	348000	1	15100	1	40
BEA-BG-SB-SSB-02-03	83	0	0.54	0	2	0	150	0	1,600,000	1	6200	1	159000	1	7600	1	70
BEA-BG-SB-SSB-03-03	91	0	0.6	0	2.2	0	170	0	2,430,000	1	4400	1	171000	1	25900	1	10
BEA-BG-SB-SSB-04-03	87	0	0.57	0	2.1	0	160	0	1,170,000	1	3500	1	101000	1	8700	1	10
BEA-BG-SB-SSB-05-03	82	0	0.54	0	2	0	150	0	2,220,000	1	4600	1	177000	1	15700	1	10
BEA-BG-SB-SSB-06-03	76	0	200	1	18	0	140	0	857,000	1	1200	1	100000	1	10500	1	10
BEA-BG-SB-SSB-07-03	88	0	0.58	0	2.1	0	160	0	5,020,000	1	3300	1	1040000	1	44100	1	10
BEA-BG-SB-SSB-08-03	77	0	0.51	0	1.8	0	140	0	3,020,000	1	4200	1	159000	1	5900	1	10
BEA-BG-SB-SSB-09-03	77	0	0.51	0	1.8	0	140	0	3,680,000	1	3200	1	181000	1	9400	1	10
BEA-BG-SB-SSB-10-03	83	0	0.54	0	2	0	160	0	724,000	1	2100	1	40700	1	5700	1	10
BEA-BG-SS-SSB-01-01	920	1	0.52	0	1.9	0	210	1	1,770,000	1	20400	1	140000	1	14900	1	10
BEA-BG-SS-SSB-02-01	84	1	0.52	0	1.9	0	150	0	3,750,000	1	16200	1	1000000	1	75800	1	10
BEA-BG-SS-SSB-03-01	80	0	0.52	0	1.9	0	150	0	3,390,000	1	9600	1	304000	1	19000	1	40
BEA-BG-SS-SSB-03-01-D	79	0	0.52	0	1.9	0	150	0	3,310,000	1	7000	1	198000	1	14600	1	10
BEA-BG-SS-SSB-04-01	98	0	0.65	0	2.4	0	180	0	2,110,000	1	8300	1	218000	1	12800	1	10
BEA-BG-SS-SSB-04-01-D	89	0	0.58	0	2.1	0	170	0	1,960,000	1	9100	1	204000	1	13800	1	10
BEA-BG-SS-SSB-05-01	79	0	0.52	0	1.9	0	150	0	1,510,000	1	3700	1	138000	1	35700	1	40
BEA-BG-SS-SSB-06-01	79	0	0.52	0	1.9	0	150	0	1,490,000	1	3000	1	141000	1	34000	1	10
BEA-BG-SS-SSB-07-01	86	0	0.56	0	2	0	160	0	3,270,000	1	3900	1	567000	1	22400	1	10
BEA-BG-SS-SSB-08-01	81	0	0.53	0	1.9	0	150	0	5,820,000	1	6400	1	357000	1	21200	1	40
BEA-BG-SS-SSB-09-01	79	0	0.52	0	1.9	0	150	0	2,480,000	1	4800	1	168000	1	10500	1	10
BEA-BG-SS-SSB-10-01	80	0	0.52	0	1.9	0	150	0	1,890,000	1	3600	1	136000	1	8200	1	10
SCS-01_0-1	5800	1	0.316	0	1.87	0	980	1	1,700,000	1	3220	1	108000	1	13000	1	150
SCS-01_2-3	51	0	0.326	0	1.93	0	39	0	11,200,000	1	6300	1	298000	1	7500	1	310
SCS-02_0-1	49	0	0.316	0	1.87	0	37	0	916,000	1	3650	1	61400	1	4470	1	190
SCS-02_2-3	54	0	0.342	0	2.03	0	41	0	7,990,000	1	8600	1	308000	1	4800	1	99
SCS-03_0-1	50	0	0.319	0	1.89	0	38	0	1,670,000	1	7520	1	131000	1	80100	1	230
SCS-03_2-3	52	0	0.33	0	1.96	0	39	0	1,750,000	1	3700	1	145000	1	21700	1	69
SCS-04_0-1	50	0	0.319	0	1.89	0	38	0	4,340,000	1	12700	1	195000	1	11800	1	240
SCS-04_2-3	51	0	0.326	0	1.93	0	39	0	574,000	1	3200	1	48100	1	3800	1	120
SCS-05_0-1	48	0	0.305	0	1.81	0	36	0	978,000	1	1280	1	77700	1	15100	1	120
SCS-05_2-3	51	0	0.327	0	1.94	0	39	0	2,900,000	1	978	1	69100	1	7240	1	9.4
SCS-06_0-1	48	0	0.308	0	1.83	0	37	0	2,150,000	1	4290	1	176000	1	18900	1	190
SCS-06_2-3	49	0	0.312	0	1.85	0	37	0	773,000	1	1580	1	48900	1	14600	1	59
SCS-07_0-1	51	0	0.323	0	1.91	0	38	0	2,090,000	1	6610	1	189000	1	40600	1	540
SCS-07_2-3	51	0	0.323	0	1.91	0	38	0	1,990,000	1	5500	1	174000	1	24500	1	260
SCS-08_0-1	50	0	0.323	0	1.91	0	38	0	1,190,000	1	4530	1	86200	1	72500	1	330
SCS-08_2-3	52	0	0.334	0	1.98	0	40	0	467,000	1	3500	1	77200	1	2800	1	150
SCS-09_0-1	48	0	0.308	0	1.83	0	37	0	1,130,000	1	6630	1	49100	1	18200	1	770
SCS-09_2-3	48	0	0.305	0	1.81	0	36	0	1,380,000	1	2400	1	70600	1	3000	1	140
SCS-10_0-1	52	0	0.33	0	1.96	0	39	0	1,420,000	1	3050	1	63200	1	3840	1	300
SCS-10_2-3	54	0	0.342	0	2.03	0	41	0	8,000,000	1	5100	1	320000	1	5700	1	180
SSA-01_0-1	56	0	0.36	0	2.13	0	43	0	2,900,000	1	4070	1	164000	1	12800	1	390
SSA-01_0-1-D	48	0	0.309	0	1.83	0	37	0	3,940,000	1	2940	1	143000	1	8920	1	8.9
SSA-01_2-3	44	0	0.284	0	1.68	0	34	0	1,010,000	1	3500	1	74500	1	4290	1	8.2
SSA-02_0-1	51	0	0.326	0	1.03	1	39	0	98,300	1	1250	1	6460	1	1900	1	9.1
SSA-02_0-1-D	52	0	0.33	0	1.96	0	39	0	152,000	1	4260	1	57800	1	2120	1	9.5
SSA-02_2-3	56	0	0.355	0	2.11	0	42	0	288,000	1	4470	1	89400	1	3580	1	94
SSA-03_0-1	48	0	0.308	0	1.83	0	37	0	2,970,000	1	4290	1	112000	1	14400	1	220
SSA-03_0-1-D	48	0	0.309	0	1.83	0	37	0	3,200,000	1	4120	1	129000	1	10800	1	140
SSA-03_2-3	47	0	0.302	0	1.79	0	36	0	409,000	1	4220	1	60500	1	7120	1	8.7
SSA-04_0-1	48	0	0.308	0	1.83	0	37	0	1,280,000	1	3350	1	101000	1	6130	1	140
SSA-04_0-1-D	48	0	0.309	0	1.83	0	37	0	2,190,000	1	4120	1	115000	1	24200	1	350
SSA-04_2-3	49	0	0.312	0	1.85	0	37	0	1,320,000	1	7050	1	66600	1	3130	1	8.9
SSA-05_0-1	49	0	0.312	0	1.85	0	37	0	2,450,000	1	3450	1	126000	1	23100	1	230
SSA-05_2-3	47	0	0.302	0	1.79	0	36	0	3,570,000	1	2890	1	191000	1	6180	1	8.8
SSA-06_0-1	50	0	0.323	0	1.91	0	38	0	2,290,000	1	5460	1	141000	1	5790	1	160
SSA-06_2-3	51	0	0.323	0	1.91	0	38	0	1,530,000	1	4430	1	140000	1	5390	1	220
SSA-07_0-1	46	0	0.296	0	1.75	0	35	0	1,060,000	1	2330	1	85500	1	5490	1	8.3
SSA-07_2-3	47	0	0.299	0	1.77	0	35	0	335,000	1	1760	1	39900	1	3700	1	8.6
SSA-08_0-1	49	0	0.312	0	1.85	0	37	0	2,610,000	1	4270	1	143000	1	13400	1	370
SSA-08_2-3	50	0	0.319	0	1.89	0	38	0	3,020,000	1	3640	1	179000	1	9980	1	250
SSA-09_0-1	49	0	0.312	0	1.85	0	37	0	2,060,000	1	4380	1	154000	1	29300	1	270
SSA-09_2-3	49	0	0.312	0	1.85	0	37	0	1,680,000	1	2480	1	78900	1	6890	1	74
SSA-10_0-1	48	0	0.305	0	1.81	0	36	0	3,500,000	1	2190	1	64700	1	4490	1	380
SSA-10_2-3	48	0	0.305	0	1.81	0	36	0	3,500,000	1	1120	1	114000	1	2540	1	8.7

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	D_MERCURY	METHOXYCHLOR	D_METHOXYCHLOR	METHYL ACETATE	D_METHYL ACETATE	NICKEL	D_NICKEL	PERCENT SOLIDS	D_PERCENT SOLIDS	PHENANTHRENE	D_PHENANTHRENE	POTASSIUM	D_POTASSIUM	PYRENE	D_PYRENE
BEA-BG-SB-SSB-01-03	1	1.4	0	1	0	1600	1	86	1	92	1	92400	1	280	1
BEA-BG-SB-SSB-02-03	1	1.4	0	1	0	2400	1	86	1	67	0	108000	1	84	0
BEA-BG-SB-SSB-03-03	0	1.5	0	1	0	1400	1	78	1	74	0	86100	1	93	0
BEA-BG-SB-SSB-04-03	0	1.5	0	1	0	1100	1	81	1	71	0	2100	0	88	0
BEA-BG-SB-SSB-05-03	0	1.4	0	1	0	1600	1	86	1	67	0	125000	1	83	0
BEA-BG-SB-SSB-06-03	0	13	0	1	0	480	1	93	1	62	0	62100	1	78	0
BEA-BG-SB-SSB-07-03	0	1.5	0	1	0	2600	1	80	1	72	0	570000	1	90	0
BEA-BG-SB-SSB-08-03	0	1.3	0	1	0	3300	1	92	1	63	0	96400	1	78	0
BEA-BG-SB-SSB-09-03	0	1.3	0	1	0	1200	1	92	1	63	0	83900	1	78	0
BEA-BG-SB-SSB-10-03	0	1.4	0	1	0	360	1	86	1	67	0	1580	0	84	0
BEA-BG-SS-SSB-01-01	0	1.3	0	1	0	950	1	89	1	390	1	77300	1	1100	1
BEA-BG-SS-SSB-02-01	0	1.3	0	0.9	0	3600	1	90	1	64	0	390000	1	80	0
BEA-BG-SS-SSB-03-01	1	1.3	0	0.9	0	1200	1	89	1	65	0	104000	1	81	0
BEA-BG-SS-SSB-03-01-D	0	1.3	0	0.9	0	1200	1	90	1	64	0	84700	1	80	0
BEA-BG-SS-SSB-04-01	0	1.7	0	1	0	1300	1	72	1	80	0	99200	1	100	0
BEA-BG-SS-SSB-04-01-D	0	1.5	0	1	0	1200	1	80	1	72	0	101000	1	90	0
BEA-BG-SS-SSB-05-01	1	1.3	0	1	0	980	1	90	1	64	0	93000	1	80	0
BEA-BG-SS-SSB-06-01	0	1.3	0	1	0	740	1	90	1	64	0	99200	1	80	0
BEA-BG-SS-SSB-07-01	0	1.4	0	1	0	1700	1	83	1	70	0	282000	1	87	0
BEA-BG-SS-SSB-08-01	1	1.4	0	1	0	3200	1	88	1	66	0	199000	1	82	0
BEA-BG-SS-SSB-09-01	0	1.3	0	1	0	1500	1	90	1	64	0	110000	1	80	0
BEA-BG-SS-SSB-10-01	0	1.4	0	1	0	1100	1	89	1	65	0	74400	1	81	0
SCS-01_0-1	1	32.8	1	3	1	1110	1	89	1	3200	1	45200	1	3500	1
SCS-01_2-3	1	1.31	0	0.87	0	2900	1	86	1	46	0	216000	1	43	0
SCS-02_0-1	1	1.27	0	0.65	0	1070	1	89	1	45	0	31300	1	41	0
SCS-02_2-3	1	1.38	0	1.1	0	800	1	82	1	49	0	149000	1	45	0
SCS-03_0-1	1	1.28	0	0.75	0	1700	1	88	1	45	0	121000	1	42	0
SCS-03_2-3	1	1.33	0	0.77	0	990	1	85	1	47	0	117000	1	43	0
SCS-04_0-1	1	1.28	0	0.72	0	1030	1	88	1	45	0	68200	1	42	0
SCS-04_2-3	1	1.31	0	1	0	650	1	86	1	46	0	30200	1	43	0
SCS-05_0-1	1	1.23	0	0.79	0	520	1	92	1	43	0	40100	1	40	0
SCS-05_2-3	0	1.31	0	1	0	341	0	86	1	46	0	53600	1	43	0
SCS-06_0-1	1	1.24	0	0.99	0	1780	1	91	1	44	0	86600	1	40	0
SCS-06_2-3	1	1.25	0	0.9	0	314	1	90	1	44	0	32900	1	41	0
SCS-07_0-1	1	1.3	0	1	0	1660	1	87	1	46	0	84000	1	42	0
SCS-07_2-3	1	1.3	0	1.1	0	1400	1	87	1	46	0	92800	1	42	0
SCS-08_0-1	1	1.3	0	1	0	631	1	87	1	46	0	64500	1	42	0
SCS-08_2-3	1	1.34	0	0.9	0	420	1	84	1	48	0	67200	1	44	0
SCS-09_0-1	1	1.24	0	1.1	0	424	1	91	1	44	0	39000	1	40	0
SCS-09_2-3	1	1.23	0	1	0	520	1	92	1	43	0	38200	1	40	0
SCS-10_0-1	1	1.33	0	0.99	0	1250	1	85	1	47	0	36500	1	43	0
SCS-10_2-3	1	1.38	0	0.86	0	880	1	82	1	49	0	208000	1	45	0
SSA-01_0-1	1	1.45	0	0.98	0	2110	1	92	1	51	0	64000	1	47	0
SSA-01_0-1-D	0	1.24	0	0.95	0	1360	1	91	1	44	0	53400	1	40	0
SSA-01_2-3	0	1.14	0	0.78	0	1220	1	99	1	40	0	37700	1	37	0
SSA-02_0-1	0	2.11	1	0.78	0	346	0	86	1	46	0	13400	0	43	0
SSA-02_0-1-D	0	1.33	0	0.84	0	332	0	85	1	47	0	44500	1	43	0
SSA-02_2-3	1	1.43	0	0.77	0	573	1	79	1	51	0	62200	1	46	0
SSA-03_0-1	1	1.24	0	0.7	0	1050	1	91	1	44	0	46900	1	40	0
SSA-03_0-1-D	1	1.24	0	0.89	0	1200	1	91	1	44	0	55200	1	40	0
SSA-03_2-3	0	1.21	0	0.77	0	618	1	93	1	43	0	36900	1	39	0
SSA-04_0-1	1	1.24	0	0.78	0	686	1	91	1	44	0	37200	1	40	0
SSA-04_0-1-D	1	1.24	0	0.97	0	1120	1	91	1	44	0	42100	1	40	0
SSA-04_2-3	0	1.25	0	0.72	0	742	1	90	1	44	0	38500	1	41	0
SSA-05_0-1	1	1.25	0	0.79	0	1640	1	90	1	44	0	53400	1	41	0
SSA-05_2-3	0	1.21	0	0.81	0	1880	1	93	1	43	0	86000	1	39	0
SSA-06_0-1	1	1.3	0	0.7	0	1130	1	87	1	46	0	93500	1	42	0
SSA-06_2-3	1	1.3	0	0.7	0	1010	1	87	1	46	0	70700	1	42	0
SSA-07_0-1	0	1.19	0	0.81	0	500	1	95	1	42	0	39800	1	39	0
SSA-07_2-3	0	1.2	0	0.84	0	368	1	94	1	42	0	19500	1	39	0
SSA-08_0-1	1	1.25	0	0.74	0	1250	1	90	1	44	0	65000	1	41	0
SSA-08_2-3	1	1.28	0	0.72	0	1480	1	88	1	45	0	87800	1	42	0
SSA-09_0-1	1	1.25	0	1.9	1	1060	1	90	1	44	0	67100	1	41	0
SSA-09_2-3	1	1.25	0	0.98	0	323	0	90	1	44	0	35700	1	41	0
SSA-10_0-1	1	1.23	0	1	0	543	1	92	1	43	0	32700	1	40	0
SSA-10_2-3	0	1.23	0	0.97	0	587	1	92	1	43	0	52700	1	40	0

Notes:
Units are microgram per kilogram (µg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Appendix C2
ProUCL Dataset for Soil
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	SELENIUM	D_SELENIUM	SILVER	D_SILVER	SODIUM	D_SODIUM	THALLIUM	D_THALLIUM	TOTAL DDD/DDE/DDT	D_TOTAL DDD/DDE/DDT	TOTAL_PAH*	D_TOTAL_PAH*	TRICHLOROFLUOROMETHANE	D_TRICHLOROFLUOROMETHANE	VANADIUM	D_VANADIUM	ZINC	D_ZINC
BEA-BG-SB-SSB-01-03	340	1	10	0	549000	1	30	0	12.5	1	1122	1	5	1	7600	1	14000	1
BEA-BG-SB-SSB-02-03	380	1	10	0	1490	0	20	0	0.78	0	380	0	2	0	4900	1	2300	1
BEA-BG-SB-SSB-03-03	110	0	10	0	2030	0	20	0	0.86	0	420	0	2	0	4800	1	2700	1
BEA-BG-SB-SSB-04-03	110	0	10	0	2030	0	20	0	0.82	0	400	0	2	0	4200	1	190	0
BEA-BG-SB-SSB-05-03	100	0	10	0	1740	0	20	0	0.77	0	380	0	2	0	5600	1	2700	1
BEA-BG-SB-SSB-06-03	190	1	10	0	1610	0	20	0	7.2	0	360	0	2	0	2200	1	1600	1
BEA-BG-SB-SSB-07-03	290	1	10	0	81200	1	20	0	0.83	0	410	0	2	0	11100	1	8800	1
BEA-BG-SB-SSB-08-03	110	0	10	0	102000	1	20	0	0.73	0	360	0	2	0	6100	1	2700	1
BEA-BG-SB-SSB-09-03	220	1	10	0	1930	0	20	0	0.72	0	360	0	2	0	8300	1	1900	1
BEA-BG-SB-SSB-10-03	440	1	140	1	1520	0	20	0	0.78	0	380	0	2	0	3500	1	150	0
BEA-BG-SS-SSB-01-01	230	1	10	0	1390	0	20	0	7.6	1	4087	1	2	1	4300	1	9400	1
BEA-BG-SS-SSB-02-01	110	0	10	0	1980	0	20	0	0.74	0	142	1	2	0	8000	1	18000	1
BEA-BG-SS-SSB-03-01	230	1	10	0	121000	1	20	0	0.75	0	370	0	2	0	7800	1	5100	1
BEA-BG-SS-SSB-03-01-D	360	1	10	0	2110	0	20	0	0.74	0	370	0	4	1	7900	1	5000	1
BEA-BG-SS-SSB-04-01	130	0	10	0	2400	0	30	0	0.92	0	460	0	2	0	6300	1	5300	1
BEA-BG-SS-SSB-04-01-D	350	1	10	0	1970	0	20	0	0.83	0	410	0	2	0	5800	1	7500	1
BEA-BG-SS-SSB-05-01	120	0	10	0	2170	0	30	0	0.74	0	370	0	2	0	3200	1	3200	1
BEA-BG-SS-SSB-06-01	150	1	10	0	2040	0	20	0	0.74	0	370	0	4	1	3200	1	3400	1
BEA-BG-SS-SSB-07-01	400	1	10	0	218000	1	20	0	0.8	0	400	0	2	0	8000	1	6700	1
BEA-BG-SS-SSB-08-01	370	1	10	0	1680	0	20	0	0.76	0	380	0	2	0	11500	1	5800	1
BEA-BG-SS-SSB-09-01	210	1	10	0	1470	0	20	0	0.74	0	370	0	2	0	6800	1	3200	1
BEA-BG-SS-SSB-10-01	150	1	10	0	1620	0	20	0	0.75	0	370	0	7	1	4300	1	2500	1
SCS-01_0-1	640	0	110	0	40200	0	386	1	0.333	0	25220	1	0.49	0	3610	1	1750	1
SCS-01_2-3	1400	1	114	0	52300	1	386	0	0.344	0	390	0	0.58	0	23200	1	205	0
SCS-02_0-1	628	0	108	0	39400	0	379	1	0.333	0	370	0	0.43	0	3290	1	2080	1
SCS-02_2-3	1000	1	119	0	43400	0	406	0	0.361	0	410	0	0.75	0	16900	1	215	0
SCS-03_0-1	618	0	107	0	38800	0	362	0	0.336	0	380	0	0.5	0	5030	1	9350	1
SCS-03_2-3	650	0	112	0	44200	1	381	0	0.348	0	390	0	0.51	0	4900	1	202	0
SCS-04_0-1	628	0	108	0	50400	1	682	1	10.28	1	380	0	0.48	0	10300	1	14400	1
SCS-04_2-3	655	0	113	0	41100	0	384	0	0.344	0	390	0	0.68	0	2900	1	203	0
SCS-05_0-1	615	0	106	0	38600	0	361	0	0.322	0	360	0	0.53	0	1770	1	191	0
SCS-05_2-3	660	0	114	0	43500	1	387	0	0.344	0	390	0	0.68	0	4700	1	205	0
SCS-06_0-1	616	0	106	0	38600	0	361	0	0.325	0	370	0	0.65	0	4090	1	191	0
SCS-06_2-3	606	0	105	0	42600	1	355	0	0.329	0	370	0	0.6	0	2360	1	188	0
SCS-07_0-1	656	0	113	0	41200	0	385	0	0.34	0	380	0	0.68	0	3890	1	11100	1
SCS-07_2-3	657	0	113	0	41200	0	385	0	0.34	0	380	0	0.7	0	4000	1	204	0
SCS-08_0-1	654	0	113	0	41000	0	383	0	0.34	0	380	0	0.68	0	4010	1	1830	1
SCS-08_2-3	659	0	114	0	41300	0	386	0	0.352	0	400	0	0.6	0	3300	1	204	0
SCS-09_0-1	631	0	109	0	39600	0	370	0	0.325	0	370	0	0.75	0	4450	1	2970	1
SCS-09_2-3	624	0	108	0	39200	0	366	0	0.322	0	360	0	0.67	0	4500	1	194	0
SCS-10_0-1	657	0	113	0	41300	0	385	0	0.348	0	390	0	0.66	0	5960	1	2100	1
SCS-10_2-3	1000	1	112	0	40700	0	380	0	0.361	0	410	0	0.57	0	22300	1	201	0
SSA-01_0-1	711	0	123	0	44600	0	417	0	0.379	0	430	0	0.65	0	5710	1	221	0
SSA-01_0-1-D	595	1	103	0	37300	0	349	0	0.326	0	370	0	0.63	0	6490	1	185	0
SSA-01_2-3	534	0	92	0	87100	1	313	0	0.299	0	340	0	0.52	0	5270	1	166	0
SSA-02_0-1	669	0	115	0	42000	0	392	0	4.03	1	390	0	0.52	0	323	1	208	0
SSA-02_0-1-D	643	1	986	1	40300	0	377	0	0.348	0	390	0	0.56	0	2750	1	199	0
SSA-02_2-3	693	0	119	0	43500	0	406	0	0.375	0	420	0	0.51	0	3890	1	215	0
SSA-03_0-1	597	0	103	0	37500	0	350	0	12.1	1	370	0	0.47	0	7120	1	185	0
SSA-03_0-1-D	599	0	103	0	45300	1	351	0	0.326	0	370	0	0.59	0	7790	1	186	0
SSA-03_2-3	569	0	98.1	0	47500	1	334	0	0.318	0	360	0	0.51	0	3180	1	177	0
SSA-04_0-1	594	0	102	0	40000	1	348	0	0.325	0	370	0	0.52	0	3940	1	184	0
SSA-04_0-1-D	605	0	804	1	38000	0	355	0	0.326	0	370	0	0.64	0	4090	1	188	0
SSA-04_2-3	615	0	106	0	38600	0	360	0	0.329	0	370	0	0.48	0	4360	1	191	0
SSA-05_0-1	633	0	109	0	39700	0	371	0	0.329	0	370	0	0.52	0	4410	1	196	0
SSA-05_2-3	601	1	100	0	58500	1	340	0	0.319	0	360	0	0.54	0	11100	1	180	0
SSA-06_0-1	607	0	105	0	38100	0	356	0	2.93	1	380	0	0.47	0	6000	1	188	0
SSA-06_2-3	604	0	104	0	37900	0	354	0	0.34	0	380	0	0.47	0	5450	1	188	0
SSA-07_0-1	580	0	100	0	36400	0	340	0	0.312	0	350	0	0.54	0	2660	1	180	0
SSA-07_2-3	593	0	102	0	37200	0	348	0	0.315	0	350	0	0.56	0	1330	1	184	0
SSA-08_0-1	590	0	102	0	37000	0	346	0	0.329	0	370	0	0.49	0	5280	1	183	0
SSA-08_2-3	601	0	104	0	37700	0	353	0	0.336	0	380	0	0.48	0	5320	1	187	0
SSA-09_0-1	628	0	108	0	39400	0	368	0	0.329	0	370	0	0.68	0	3980	1	195	0
SSA-09_2-3	624	0	108	0	46300	1	366	0	0.329	0	370	0	0.65	0	3630	1	194	0
SSA-10_0-1	606	0	105	0	40300	1	355	0	0.322	0	360	0	0.66	0	4900	1	188	0
SSA-10_2-3	577	0	99.4	0	36200	0	338	0	0.322	0	360	0	0.64	0	5790	1	179	0

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

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Appendix C3
Soil Data Summary After Removing Outliers

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Table C3
Summary Statistics of Soil Dataset with Outliers Removed
MCRD Parris Island, South Carolina

Compound	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)	Outliers Removed
2,4'-D	1 / 66	20 - 20	20.0	11 - 22	0
4,4'-DDD	1 / 66	1.8 - 1.8	1.8	0.185 - 4.7	0
4,4'-DDE	4 / 66	2.4 - 12.1	7.2025	0.183 - 5.4	0
4,4'-DDT	5 / 66	1.8 - 5.2	3.766	0.299 - 7.2	0
Alpha-Chlordane	17 / 63	0.862 - 5.71	2.9471765	0.145 - 0.65	3
Aluminum	63 / 63	127000 - 9360000	3869603.2	NA	3
Anthracene	2 / 66	77 - 590	333.5	37 - 80	0
Arsenic	48 / 65	250 - 2400	1037.1042	60 - 669	1
Barium	66 / 66	681 - 32500	11213.348	NA	0
Benzaldehyde	2 / 66	360 - 800	580.0	180 - 210	0
Benzo(a)anthracene	3 / 66	150 - 2200	950.0	26 - 82	0
Benzo(a)pyrene	4 / 66	58 - 1400	539.5	36 - 63	0
Benzo(b)fluoranthene	3 / 65	89 - 540	273	34 - 89	1
Benzo(g,h,i)perylene	2 / 66	220 - 1100	660.0	28 - 180	0
Benzo(k)fluoranthene	3 / 65	66 - 520	252	42 - 81	1
Beryllium	39 / 63	60 - 190	117.42051	10 - 92.3	3
Cadmium	5 / 66	66.5 - 320	161.64	10 - 73.5	0
Calcium	35 / 62	39900 - 1390000	488160	970 - 15100	4
Carbazole	1 / 66	450 - 450	450.0	46 - 83	0
Carbon Disulfide	27 / 65	2 - 100	32.344444	2 - 3.2	1
Chromium	62 / 62	484 - 8030	4037.4839	NA	4
Chrysene	3 / 66	180 - 2500	1080	36 - 91	0
Cobalt	52 / 61	129 - 620	299.03846	10 - 138	5
Copper	66 / 66	320 - 4850	2298.9394	NA	0
Dalapon	1 / 66	25 - 25	25.0	4 - 24	0
Dibenzo(a,h)anthracene	1 / 66	550 - 550	550.0	26 - 200	0
Dichlorodifluoromethane	2 / 66	1 - 2.8	1.9	0.62 - 3	0
Endosulfan Sulfate	3 / 66	2.42 - 13.6	6.83	0.224 - 6.8	0
Endrin	1 / 66	5.45 - 5.45	5.5	0.17 - 9.7	0
Endrin Aldehyde	1 / 66	6.53 - 6.53	6.5	0.234 - 12	0
Fluoranthene	3 / 65	84 - 920	421.33333	44 - 98	1
Gamma-Chlordane	1 / 66	200 - 200	200.0	0.284 - 0.65	0
Heptachlor	1 / 66	1.03 - 1.03	1.0	1.68 - 18	0
Indeno(1,2,3-CD)pyrene	2 / 66	210 - 980	595.0	34 - 180	0
Iron	63 / 63	98300 - 5820000	2103671.4	NA	3
Lead	62 / 62	978 - 9600	4189.9677	NA	4
Magnesium	63 / 63	6460 - 357000	138293.02	NA	3
Manganese	61 / 61	1900 - 35700	11609.672	NA	5
Mercury	37 / 65	40 - 540	194.45946	8.2 - 10	1
Methoxychlor	2 / 66	2.11 - 32.8	17.5	1.14 - 13	0
Methyl Acetate	2 / 66	1.9 - 3	2.5	0.65 - 1.1	0
Nickel	61 / 65	314 - 3300	1201.4098	323 - 346	1
Phenanthrene	2 / 65	92 - 390	241	40 - 80	1
Potassium	57 / 60	19500 - 149000	68710.526	1580 - 13400	6
Pyrene	3 / 66	280 - 3500	1626.6667	37 - 100	0
Selenium	21 / 66	150 - 1400	454.71429	100 - 711	0
Silver	3 / 66	140 - 986	643.33333	10 - 123	0
Sodium	15 / 64	40000 - 121000	60146.667	1390 - 44600	2
Thallium	2 / 65	379 - 386	382.5	20 - 417	1
Total DDD/DDE/DDT	6 / 66	2.93 - 12.5	8.24	0.299 - 7.2	0
Total PAH	4 / 66	142 - 25220	7642.75	340 - 460	0
Trichlorofluoromethane	5 / 66	2 - 7	4.4	0.43 - 2	0
Vanadium	63 / 63	323 - 11500	5130.5238	NA	3
Zinc	28 / 66	1600 - 18000	5620.7143	150 - 221	0

Notes:

NA = Not Applicable

µg/kg = Micrograms per kilograms

Soil data are provided in Appendix C2

Soil data that exclude outliers are provided in Appendix C4

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Appendix C4
Soil Data After Removing Outliers

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Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	2,4-D	D_2,4-D	4,4'-DDD	D_4,4'-DDD	4,4'-DDE	D_4,4'-DDE	4,4'-DDT	D_4,4'-DDT	ALPHA-CHLORDANE	D_ALPHA-CHLORDANE	ALUMINUM	D_ALUMINUM	ANTHRACENE	D_ANTHRACENE	ARSENIC	D_ARSENIC	BARIUM	D_BARIUM	BENZALDEHYDE	D_BENZALDEHYDE
BEA-BG-SB-SSB-01-03	18	0	1.8	1	8.9	1	1.8	1	0.54	0	4520000	1	67	0	1700	1	15200	1		
BEA-BG-SB-SSB-02-03	18	0	0.5	0	0.58	0	0.78	0	0.54	0			68	0	1400	1	7700	1		
BEA-BG-SB-SSB-03-03	20	0	0.56	0	0.64	0	0.86	0	0.6	0	3940000	1	75	0	90	0	16100	1	210	0
BEA-BG-SB-SSB-04-03	19	0	0.53	0	0.61	0	0.82	0	0.57	0	3600000	1	71	0	1500	1	6600	1		
BEA-BG-SB-SSB-05-03	18	0	0.5	0	0.58	0	0.77	0	0.54	0	4440000	1	67	0	80	0	16200	1		
BEA-BG-SB-SSB-06-03	17	0	4.7	0	5.4	0	7.2	0			746000	1	62	0	390	1	2900	1		
BEA-BG-SB-SSB-07-03	20	0	0.54	0	0.62	0	0.83	0	0.58	0	4990000	1	72	0	1600	1	9600	1		
BEA-BG-SB-SSB-08-03	17	0	0.47	0	0.54	0	0.73	0	0.51	0	6280000	1	63	0	520	1	13000	1		
BEA-BG-SB-SSB-09-03	17	0	0.47	0	0.54	0	0.72	0	0.51	0	4670000	1	63	0	890	1	6200	1		
BEA-BG-SB-SSB-10-03	18	0	0.51	0	0.58	0	0.78	0	0.54	0	2430000	1	68	0	250	1	1800	1		
BEA-BG-SS-SSB-01-01	18	0	0.48	0	2.4	1	5.2	1	0.52	0	3040000	1	77	1	60	0	13000	1		
BEA-BG-SS-SSB-02-01	17	0	0.48	0	0.55	0	0.74	0	0.52	0	4480000	1	64	0	1200	1	11100	1		
BEA-BG-SS-SSB-03-01	18	0	0.48	0	0.56	0	0.75	0	1.5	1	4300000	1	65	0	1100	1	14400	1		
BEA-BG-SS-SSB-03-01-D	17	0	0.48	0	0.56	0	0.74	0	0.52	0	3750000	1	64	0	890	1	13100	1	180	0
BEA-BG-SS-SSB-04-01	22	0	0.6	0	0.69	0	0.92	0	0.65	0	4430000	1	80	0	110	0	12000	1	360	1
BEA-BG-SS-SSB-04-01-D	20	0	0.54	0	0.62	0	0.83	0	0.58	0	3510000	1	72	0	520	1	11600	1		
BEA-BG-SS-SSB-05-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	2960000	1	64	0	100	0	15400	1		
BEA-BG-SS-SSB-06-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	2140000	1	65	0	500	1	9200	1		
BEA-BG-SS-SSB-07-01	19	0	0.52	0	0.6	0	0.8	0	0.56	0	4150000	1	70	0	710	1	12100	1		
BEA-BG-SS-SSB-08-01	18	0	0.49	0	0.57	0	0.76	0	0.53	0	9080000	1	66	0	1300	1	21200	1		
BEA-BG-SS-SSB-09-01	17	0	0.48	0	0.56	0	0.74	0	0.52	0	4820000	1	65	0	610	1	9900	1		
BEA-BG-SS-SSB-10-01	18	0	0.49	0	0.56	0	0.75	0	0.52	0	3780000	1	65	0	500	1	7800	1		
SCS-01_0-1	12	0	0.206	0	0.204	0	0.333	0	0.161	0	4120000	1	590	1	640	0	15600	1		
SCS-01_2-3	12	0	0.213	0	0.211	0	0.344	0	4.65	1			42	0			26900	1		
SCS-02_0-1	12	0	0.206	0	0.204	0	0.333	0	2.23	1	3180000	1	41	0	628	0	7280	1		
SCS-02_2-3	13	0	0.223	0	0.221	0	0.361	0	2.5	1			44	0	2400	1	17100	1		
SCS-03_0-1	12	0	0.208	0	0.206	0	0.336	0	0.163	0	6450000	1	41	0	1180	1	30400	1		
SCS-03_2-3	12	0	0.216	0	0.213	0	0.348	0	0.169	0	4000000	1	43	0	1000	1	32500	1		
SCS-04_0-1	12	0	0.208	0	5.41	1	4.87	1	0.163	0	5270000	1	41	0	1550	1	16800	1		
SCS-04_2-3	12	0	0.213	0	0.211	0	0.344	0	0.166	0	2190000	1	42	0	910	1	5500	1		
SCS-05_0-1	11	0	0.199	0	0.197	0	0.322	0			1530000	1	39	0	615	0	11600	1		
SCS-05_2-3	12	0	0.213	0	0.211	0	0.344	0	2.36	1	1160000	1	42	0	1220	1	13000	1		
SCS-06_0-1	11	0	0.201	0	0.199	0	0.325	0	0.157	0	5910000	1	40	0	818	1	26900	1		
SCS-06_2-3	12	0	0.204	0	0.201	0	0.329	0	2.3	1	904000	1	40	0	679	1	4300	1		
SCS-07_0-1	12	0	0.21	0	0.208	0	0.34	0	0.165	0	4630000	1	42	0	656	0	22400	1		
SCS-07_2-3	12	0	0.21	0	0.208	0	0.34	0	0.165	0	4030000	1	42	0	880	1	16800	1		
SCS-08_0-1	12	0	0.211	0	0.208	0	0.34	0	0.165	0	2100000	1	42	0	1310	1	15200	1		
SCS-08_2-3	12	0	0.218	0	0.216	0	0.352	0	0.17	0	2870000	1	43	0	659	0	5800	1		
SCS-09_0-1	11	0	0.201	0	0.199	0	0.325	0	0.157	0	2290000	1	40	0	1810	1	9190	1		
SCS-09_2-3	11	0	0.199	0	0.197	0	0.322	0	2.56	1	2730000	1	39	0	1000	1	4000	1		
SCS-10_0-1	12	0	0.215	0	0.213	0	0.348	0	0.168	0	4090000	1	43	0	1110	1	4430	1		
SCS-10_2-3	13	0	0.223	0	0.221	0	0.361	0	0.175	0	9360000	1	44	0	2300	1	10300	1		
SSA-01_0-1	20	1	0.235	0	0.232	0	0.379	0	2.45	1	6270000	1	47	0	968	1	12600	1		
SSA-01_0-1-D	12	0	0.201	0	0.199	0	0.326	0	0.157	0	4670000	1	40	0	882	1	10500	1		
SSA-01_2-3	11	0	0.185	0	0.183	0	0.299	0	0.145	0	3920000	1	37	0	892	1	4630	1		
SSA-02_0-1	12	0	0.213	0	0.211	0	4.03	1	3.86	1	127000	1	42	0	669	0	681	1		
SSA-02_0-1-D	12	0	0.215	0	0.213	0	0.348	0	0.168	0	2360000	1	43	0	720	1	3310	1		
SSA-02_2-3	13	0	0.232	0	0.229	0	0.375	0	0.181	0	3610000	1	46	0	1230	1	4260	1		
SSA-03_0-1	11	0	0.201	0	12.1	1	0.325	0	0.157	0	4610000	1	40	0	855	1	8260	1		
SSA-03_0-1-D	11	0	0.201	0	0.199	0	0.326	0	0.158	0	4440000	1	40	0	1000	1	7550	1		
SSA-03_2-3	11	0	0.197	0	0.195	0	0.318	0	0.154	0	2220000	1	39	0	608	1	3710	1		
SSA-04_0-1	11	0	0.201	0	0.199	0	0.325	0	0.862	1	2830000	1	40	0	594	0	5780	1		
SSA-04_0-1-D	11	0	0.201	0	0.199	0	0.326	0	0.158	0	4960000	1	40	0	605	0	16100	1		
SSA-04_2-3	12	0	0.204	0	0.201	0	0.329	0	1.49	1	3550000	1	40	0	721	1	5400	1		
SSA-05_0-1	12	0	0.204	0	0.201	0	0.329	0	0.159	0	5180000	1	40	0	873	1	18600	1		
SSA-05_2-3	11	0	0.197	0	0.195	0	0.319	0			4480000	1	39	0	1790	1	10700	1		
SSA-06_0-1	12	0	0.211	0	0.208	0	2.93	1	1.97	1	5920000	1	42	0	1020	1	11500	1		
SSA-06_2-3	12	0	0.21	0	0.208	0	0.34	0	3.75	1	4780000	1	42	0	604	0	11100	1		
SSA-07_0-1	11	0	0.193	0	0.191	0	0.312	0	0.151	0	1420000	1	38	0	680	1	6440	1		
SSA-07_2-3	11	0	0.195	0	0.193	0	0.315	0	4.33	1	958000	1	39	0	593	0	2940	1		
SSA-08_0-1	12	0	0.203	0	0.201	0	0.329	0	0.159	0	4880000	1	40	0	1290	1	13400	1		
SSA-08_2-3	12	0	0.208	0	0.206	0	0.336	0	4.44	1	5440000	1	41	0	995	1	12700	1		
SSA-09_0-1	12	0	0.204	0	0.201	0	0.329	0	0.159	0	4720000	1	40	0	844	1	15400	1		
SSA-09_2-3	12	0	0.204	0	0.201	0	0.329	0	5.71	1	2100000	1	40	0	624	0	5040	1		
SSA-10_0-1	11	0	0.199	0	0.197	0	0.322	0	0.156	0	4610000	1	39	0	606	0	3700	1		
SSA-10_2-3	11	0	0.199	0	0.197	0	0.322	0	3.14	1	2860000	1	39	0	666	1	3680	1		

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	BENZO(A)ANTHRACENE	D_BENZO(A)ANTHRACENE	BENZO(A)PYRENE	D_BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	D_BENZO(B)FLUORANTHENE	BENZO(G,H,I)PERYLENE	D_BENZO(G,H,I)PERYLENE
BEA-BG-SB-SSB-01-03	150	1	160	1	190	1	150	0
BEA-BG-SB-SSB-02-03	69	0	53	0	74	0	150	0
BEA-BG-SB-SSB-03-03	76	0	58	0	82	0	170	0
BEA-BG-SB-SSB-04-03	72	0	56	0	79	0	160	0
BEA-BG-SB-SSB-05-03	68	0	52	0	74	0	150	0
BEA-BG-SB-SSB-06-03	64	0	49	0	69	0	140	0
BEA-BG-SB-SSB-07-03	74	0	56	0	80	0	160	0
BEA-BG-SB-SSB-08-03	64	0	49	0	70	0	140	0
BEA-BG-SB-SSB-09-03	64	0	49	0	70	0	140	0
BEA-BG-SB-SSB-10-03	69	0	53	0	75	0	150	0
BEA-BG-SS-SSB-01-01	500	1	540	1	540	1	220	1
BEA-BG-SS-SSB-02-01	65	0	58	1	89	1	140	0
BEA-BG-SS-SSB-03-01	66	0	51	0	72	0	140	0
BEA-BG-SS-SSB-03-01-D	66	0	50	0	71	0	140	0
BEA-BG-SS-SSB-04-01	82	0	63	0	89	0	180	0
BEA-BG-SS-SSB-04-01-D	74	0	56	0	80	0	160	0
BEA-BG-SS-SSB-05-01	66	0	50	0	71	0	140	0
BEA-BG-SS-SSB-06-01	66	0	50	0	71	0	140	0
BEA-BG-SS-SSB-07-01	71	0	55	0	77	0	160	0
BEA-BG-SS-SSB-08-01	67	0	52	0	73	0	150	0
BEA-BG-SS-SSB-09-01	66	0	51	0	71	0	140	0
BEA-BG-SS-SSB-10-01	66	0	51	0	72	0	140	0
SCS-01_0-1	2200	1	1400	1			1100	1
SCS-01_2-3	30	0	42	0	39	0	32	0
SCS-02_0-1	29	0	40	0	37	0	31	0
SCS-02_2-3	31	0	44	0	41	0	34	0
SCS-03_0-1	29	0	41	0	38	0	31	0
SCS-03_2-3	30	0	42	0	39	0	33	0
SCS-04_0-1	29	0	41	0	38	0	31	0
SCS-04_2-3	30	0	42	0	39	0	32	0
SCS-05_0-1	28	0	39	0	36	0	30	0
SCS-05_2-3	30	0	42	0	39	0	32	0
SCS-06_0-1	28	0	40	0	37	0	30	0
SCS-06_2-3	28	0	40	0	37	0	31	0
SCS-07_0-1	29	0	41	0	38	0	32	0
SCS-07_2-3	29	0	41	0	38	0	32	0
SCS-08_0-1	29	0	41	0	38	0	32	0
SCS-08_2-3	31	0	43	0	40	0	33	0
SCS-09_0-1	28	0	40	0	37	0	30	0
SCS-09_2-3	28	0	39	0	36	0	30	0
SCS-10_0-1	30	0	42	0	39	0	33	0
SCS-10_2-3	31	0	44	0	41	0	34	0
SSA-01_0-1	33	0	46	0	43	0	35	0
SSA-01_0-1-D	28	0	40	0	37	0	30	0
SSA-01_2-3	26	0	36	0	34	0	28	0
SSA-02_0-1	30	0	42	0	39	0	32	0
SSA-02_0-1-D	30	0	42	0	39	0	33	0
SSA-02_2-3	32	0	45	0	42	0	35	0
SSA-03_0-1	28	0	39	0	37	0	30	0
SSA-03_0-1-D	28	0	40	0	37	0	30	0
SSA-03_2-3	28	0	39	0	36	0	30	0
SSA-04_0-1	28	0	40	0	37	0	30	0
SSA-04_0-1-D	28	0	39	0	37	0	30	0
SSA-04_2-3	28	0	40	0	37	0	31	0
SSA-05_0-1	28	0	40	0	37	0	31	0
SSA-05_2-3	28	0	39	0	36	0	30	0
SSA-06_0-1	29	0	41	0	38	0	32	0
SSA-06_2-3	29	0	41	0	38	0	32	0
SSA-07_0-1	27	0	38	0	35	0	29	0
SSA-07_2-3	27	0	38	0	35	0	29	0
SSA-08_0-1	28	0	40	0	37	0	31	0
SSA-08_2-3	29	0	41	0	38	0	31	0
SSA-09_0-1	28	0	40	0	37	0	31	0
SSA-09_2-3	28	0	40	0	37	0	31	0
SSA-10_0-1	28	0	39	0	36	0	30	0
SSA-10_2-3	28	0	39	0	36	0	30	0

Notes:
Units are microgram per kilogram (μg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	BENZO(K)FLUORANTHENE	D_BENZO(K)FLUORANTHENE	BERYLLIUM	D_BERYLLIUM	CADMIUM	D_CADMIUM	CALCIUM	D_CALCIUM	CARBAZOLE	D_CARBAZOLE	CARBON DISULFIDE	D_CARBON DISULFIDE	CHROMIUM	D_CHROMIUM
BEA-BG-SB-SSB-01-03	170	1	180	1	10	0	1390000	1	69	0	2	0	7200	1
BEA-BG-SB-SSB-02-03	68	0	90	1	10	0	1080000	1	70	0	2	0	6400	1
BEA-BG-SB-SSB-03-03	76	0	120	1	10	0	446000	1	77	0	2	0	4800	1
BEA-BG-SB-SSB-04-03	72	0	10	0	10	0	267000	1	74	0	2	0	4400	1
BEA-BG-SB-SSB-05-03	68	0	110	1	10	0	467000	1	70	0	2	0	6600	1
BEA-BG-SB-SSB-06-03	63	0	60	1	10	0	734000	1	65	0	2	0	2600	1
BEA-BG-SB-SSB-07-03	73	0			10	0			75	0	2	0		
BEA-BG-SB-SSB-08-03	64	0	10	0	10	0	232000	1	65	0	2	0	7400	1
BEA-BG-SB-SSB-09-03	64	0	10	0	10	0	1240	0	65	0	2	0	5900	1
BEA-BG-SB-SSB-10-03	68	0	10	0	10	0	970	0	70	0	2	0	2700	1
BEA-BG-SS-SSB-01-01	520	1	10	0	240	1	1070000	1	67	0	2	0	4500	1
BEA-BG-SS-SSB-02-01	66	1	150	1	320	1			66	0	2	0	7200	1
BEA-BG-SS-SSB-03-01	66	0	100	1	110	1			67	0	2	0	5400	1
BEA-BG-SS-SSB-03-01-D	65	0	90	1	10	0	1290000	1	67	0	2	0	5500	1
BEA-BG-SS-SSB-04-01	81	0	10	0	10	0	623000	1	83	0	2	0	4800	1
BEA-BG-SS-SSB-04-01-D	73	0	80	1	10	0	521000	1	75	0	2	0	3900	1
BEA-BG-SS-SSB-05-01	65	0	80	1	10	0	202000	1	67	0	2	0	4100	1
BEA-BG-SS-SSB-06-01	65	0	100	1	10	0	756000	1	67	0	2	0	3900	1
BEA-BG-SS-SSB-07-01	71	0	180	1	10	0			72	0	2	0	7400	1
BEA-BG-SS-SSB-08-01	67	0	120	1	10	0	487000	1	68	0	2	0	7500	1
BEA-BG-SS-SSB-09-01	66	0	80	1	10	0	75300	1	67	0	2	0	4800	1
BEA-BG-SS-SSB-10-01	66	0	70	1	10	0	39900	1	68	0	2	0	3400	1
SCS-01_0-1			110	1	66.2	0	486000	1	450	1	2.1	0	2310	1
SCS-01_2-3	48	0	190	1	68.2	0	1000000	1	53	0	72	1		
SCS-02_0-1	47	0	86.7	0	65	0	72400	1	51	0	2.2	1	2580	1
SCS-02_2-3	51	0	160	1	71.6	0	14700	0	56	0	100	1		
SCS-03_0-1	47	0			63.9	0	186000	1	52	0	2.1	0	3700	1
SCS-03_2-3	49	0	160	1	67.2	0	13800	0	54	0	54	1	3200	1
SCS-04_0-1	47	0	86.6	0	64.9	0	387000	1	52	0	2	0	6290	1
SCS-04_2-3	48	0	90.3	0	67.7	0	13900	0	53	0			2400	1
SCS-05_0-1	45	0	106	1	63.6	0	13000	0	50	0	5.2	1	1740	1
SCS-05_2-3	48	0	159	1	68.3	0	14000	0	53	0	80	1	2630	1
SCS-06_0-1	46	0			63.7	0	376000	1	50	0	11	1	3670	1
SCS-06_2-3	46	0	83.6	1	62.7	0	12900	0	51	0	100	1	1990	1
SCS-07_0-1	48	0	113	1	67.9	0	487000	1	52	0	2.9	0	3330	1
SCS-07_2-3	48	0	150	1	67.9	0	406000	1	52	0	3.1	1	3200	1
SCS-08_0-1	48	0	90.2	0	67.6	0	525000	1	52	0	2.9	0	3380	1
SCS-08_2-3	50	0	90.9	0	68.2	0	346000	1	54	0	76	1	3300	1
SCS-09_0-1	46	0	87	0	65.3	0	276000	1	50	0	3.2	0	8030	1
SCS-09_2-3	45	0	86.1	0	64.6	0	13200	0	50	0	2.8	0	2900	1
SCS-10_0-1	49	0	90.7	0	68	0	131000	1	54	0	8	1	3630	1
SCS-10_2-3	51	0	120	1	67.1	0	13800	0	56	0	89	1		
SSA-01_0-1	53	0	135	1	73.5	0	15100	0	58	0	6	1	4490	1
SSA-01_0-1-D	46	0	113	1	61.6	0	12600	0	50	0	5.8	1	4580	1
SSA-01_2-3	42	0	73.6	0	55.2	0	11300	0	46	0	2.2	0	4460	1
SSA-02_0-1	48	0	92.3	0	69.2	0	14200	0	53	0	8.5	1	484	1
SSA-02_0-1-D	49	0	155	1	66.5	1	13600	0	54	0	11	1	2580	1
SSA-02_2-3	53	0	179	1	71.7	1	14700	0	58	0	63	1	3500	1
SSA-03_0-1	46	0	103	1	61.8	0	12700	0	50	0	2	0	3920	1
SSA-03_0-1-D	46	0	82.6	1	62	0	12700	0	50	0	2.5	0	4750	1
SSA-03_2-3	45	0	78.5	0	58.9	0	12100	0	49	0	2.8	1	3730	1
SSA-04_0-1	46	0	81.9	0	61.4	0	12600	0	50	0	12	1	2800	1
SSA-04_0-1-D	46	0	104	1	62.6	0	12800	0	50	0	2.7	0	2720	1
SSA-04_2-3	46	0	84.8	1	63.6	0	13000	0	51	0	3.8	1	4710	1
SSA-05_0-1	46	0	131	1	65.5	0	389000	1	51	0	2.2	0	3020	1
SSA-05_2-3	45	0	100	1	60.1	0	12300	0	49	0	8.3	1	5360	1
SSA-06_0-1	48	0	94.1	1	62.8	0	379000	1	52	0	2	1	4450	1
SSA-06_2-3	48	0	83.4	0	62.5	0	216000	1	52	0	3.9	1	3620	1
SSA-07_0-1	44	0	80	0	60	0	12300	0	48	0	3.7	1	2110	1
SSA-07_2-3	44	0	81.8	0	61.4	0	12600	0	49	0	19	1	1880	1
SSA-08_0-1	46	0	102	1	61	0	495000	1	51	0	2.1	0	3490	1
SSA-08_2-3	47	0	93.3	1	62.2	0	252000	1	52	0	2	0	3620	1
SSA-09_0-1	46	0	141	1	64.9	0	757000	1	51	0	2.9	0	2720	1
SSA-09_2-3	46	0	86.1	0	64.6	0	13200	0	51	0	49	1	2110	1
SSA-10_0-1	45	0	83.6	0	62.7	0	239000	1	50	0	2.8	0	2570	1
SSA-10_2-3	45	0	79.6	0	59.7	0	12200	0	50	0	74	1	3970	1

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Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	CHRYSENE	D_CHRYSENE	COBALT	D_COBALT	COPPER	D_COPPER	DALAPON	D_DALAPON	DIBENZO(A,H)ANTHRACENE	D_DIBENZO(A,H)ANTHRACENE	DICHLORODIFLUOROMETHANE	D_DICHLORODIFLUOROMETHANE
BEA-BG-SB-SSB-01-03	180	1	330	1	1800	1	20	0	160	0	2	0
BEA-BG-SB-SSB-02-03	76	0	590	1	890	1	20	0	160	0	2	0
BEA-BG-SB-SSB-03-03	85	0	340	1	1300	1	22	0	180	0	2	0
BEA-BG-SB-SSB-04-03	81	0	190	1	720	1	21	0	170	0	2	0
BEA-BG-SB-SSB-05-03	76	0	280	1	1200	1	20	0	160	0	2	0
BEA-BG-SB-SSB-06-03	71	0	200	1	570	1	18	0	150	0	2	0
BEA-BG-SB-SSB-07-03	82	0			1500	1	21	0	180	0	2	0
BEA-BG-SB-SSB-08-03	72	0	570	1	830	1	18	0	150	0	2	0
BEA-BG-SB-SSB-09-03	71	0	240	1	740	1	18	0	150	0	2	0
BEA-BG-SB-SSB-10-03	77	0	10	0	320	1	20	0	160	0	2	0
BEA-BG-SS-SSB-01-01	560	1	220	1	3700	1	19	0	160	0	2	0
BEA-BG-SS-SSB-02-01	72	0			3800	1	19	0	160	0	2	0
BEA-BG-SS-SSB-03-01	74	0	450	1	1900	1	19	0	160	0	2	0
BEA-BG-SS-SSB-03-01-D	73	0	400	1	2000	1	19	0	160	0	2	0
BEA-BG-SS-SSB-04-01	91	0	280	1	2100	1	24	0	200	0	3	0
BEA-BG-SS-SSB-04-01-D	82	0	270	1	2200	1	21	0	180	0	2	0
BEA-BG-SS-SSB-05-01	73	0	240	1	2300	1	19	0	160	0	2	0
BEA-BG-SS-SSB-06-01	73	0	260	1	2400	1	25	1	160	0	2	0
BEA-BG-SS-SSB-07-01	79	0	620	1	1800	1	20	0	170	0	2	0
BEA-BG-SS-SSB-08-01	75	0			1500	1	19	0	160	0	2	0
BEA-BG-SS-SSB-09-01	73	0	270	1	790	1	19	0	160	0	2	0
BEA-BG-SS-SSB-10-01	74	0	220	1	850	1	19	0	160	0	2	0
SCS-01_0-1	2500	1	155	1	1450	1	4.5	0	550	1	1	1
SCS-01_2-3	41	0			2900	1	4.6	0	29	0	0.83	0
SCS-02_0-1	40	0	314	1	1340	1	4.5	0	28	0	0.62	0
SCS-02_2-3	43	0	540	1	2200	1	4.9	0	31	0	1.1	0
SCS-03_0-1	40	0	490	1	3440	1	4.5	0	29	0	0.72	0
SCS-03_2-3	42	0			2300	1	4.7	0	30	0	0.73	0
SCS-04_0-1	40	0	314	1	4510	1	4.5	0	29	0	0.68	0
SCS-04_2-3	41	0	410	1	1900	1	4.6	0	29	0	0.98	0
SCS-05_0-1	38	0	276	1	2140	1	4.3	0	27	0	0.76	0
SCS-05_2-3	41	0	182	1	1890	1	4.6	0	29	0	0.98	0
SCS-06_0-1	39	0	403	1	2850	1	4.4	0	28	0	0.94	0
SCS-06_2-3	39	0	251	1	3630	1	4.4	0	28	0	0.86	0
SCS-07_0-1	41	0	419	1	3030	1	4.6	0	29	0	0.97	0
SCS-07_2-3	41	0	500	1	2700	1	4.6	0	29	0	1	0
SCS-08_0-1	41	0	135	0	3810	1	4.6	0	29	0	0.97	0
SCS-08_2-3	42	0	180	1	1700	1	4.8	0	30	0	0.86	0
SCS-09_0-1	39	0	131	0	4850	1	4.4	0	28	0	1.1	0
SCS-09_2-3	38	0	180	1	1600	1	4.3	0	27	0	0.96	0
SCS-10_0-1	42	0	136	0	1330	1	4.7	0	30	0	0.94	0
SCS-10_2-3	43	0	450	1	2300	1	4.9	0	31	0	0.83	0
SSA-01_0-1	45	0	306	1	2770	1	5.1	0	32	0	0.94	0
SSA-01_0-1-D	39	0	277	1	2050	1	4.4	0	28	0	0.91	0
SSA-01_2-3	36	0	212	1	3470	1	4	0	26	0	0.74	0
SSA-02_0-1	41	0	138	0	2680	1	4.6	0	29	0	0.75	0
SSA-02_0-1-D	42	0	133	0	2590	1	4.7	0	30	0	0.81	0
SSA-02_2-3	45	0	239	1	3500	1	5	0	32	0	0.74	0
SSA-03_0-1	39	0	196	1	3210	1	4.4	0	28	0	0.67	0
SSA-03_0-1-D	39	0	196	1	2640	1	4.4	0	28	0	0.85	0
SSA-03_2-3	38	0	157	1	3950	1	4.3	0	27	0	0.74	0
SSA-04_0-1	39	0	133	1	2840	1	4.4	0	28	0	2.8	1
SSA-04_0-1-D	39	0	125	0	2460	1	4.4	0	28	0	0.93	0
SSA-04_2-3	39	0	276	1	3230	1	4.4	0	28	0	0.69	0
SSA-05_0-1	39	0	131	1	3250	1	4.4	0	28	0	0.75	0
SSA-05_2-3	38	0	410	1	3000	1	4.3	0	27	0	0.78	0
SSA-06_0-1	41	0	356	1	2560	1	4.6	0	29	0	0.67	0
SSA-06_2-3	41	0	261	1	1790	1	4.6	0	29	0	0.67	0
SSA-07_0-1	37	0	150	1	2200	1	4.2	0	27	0	0.77	0
SSA-07_2-3	38	0	123	0	2320	1	4.3	0	27	0	0.8	0
SSA-08_0-1	39	0	335	1	2280	1	4.4	0	28	0	0.71	0
SSA-08_2-3	40	0	363	1	1980	1	4.5	0	29	0	0.68	0
SSA-09_0-1	39	0	260	1	2870	1	4.4	0	28	0	0.98	0
SSA-09_2-3	39	0	129	1	2890	1	4.4	0	28	0	0.93	0
SSA-10_0-1	38	0	125	0	2230	1	4.3	0	27	0	0.95	0
SSA-10_2-3	38	0	129	1	1890	1	4.3	0	27	0	0.92	0

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Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	ENDOSULFAN SULFATE	D_ENDOSULFAN SULFATE	ENDRIN	D_ENDRIN	ENDRIN ALDEHYDE	D_ENDRIN ALDEHYDE	FLUORANTHENE	D_FLUORANTHENE	GAMMA-CHLORDANE	D_GAMMA-CHLORDANE	HEPTACHLOR	D_HEPTACHLOR	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE
BEA-BG-SB-SSB-01-03	0.73	0	1	0	1.3	0	260	1	0.54	0	2	0	150	0
BEA-BG-SB-SSB-02-03	0.74	0	1	0	1.4	0	83	0	0.54	0	2	0	150	0
BEA-BG-SB-SSB-03-03	0.82	0	1.2	0	1.5	0	91	0	0.6	0	2.2	0	170	0
BEA-BG-SB-SSB-04-03	0.78	0	1.1	0	1.4	0	87	0	0.57	0	2.1	0	160	0
BEA-BG-SB-SSB-05-03	0.73	0	1	0	1.4	0	82	0	0.54	0	2	0	150	0
BEA-BG-SB-SSB-06-03	6.8	0	9.7	0	12	0	76	0	200	1	18	0	140	0
BEA-BG-SB-SSB-07-03	0.79	0	1.1	0	1.4	0	88	0	0.58	0	2.1	0	160	0
BEA-BG-SB-SSB-08-03	0.69	0	0.98	0	1.3	0	77	0	0.51	0	1.8	0	140	0
BEA-BG-SB-SSB-09-03	0.69	0	0.98	0	1.3	0	77	0	0.51	0	1.8	0	140	0
BEA-BG-SB-SSB-10-03	0.74	0	1	0	1.4	0	83	0	0.54	0	2	0	160	0
BEA-BG-SS-SSB-01-01	0.71	0	1	0	1.3	0	920	1	0.52	0	1.9	0	210	1
BEA-BG-SS-SSB-02-01	0.7	0	0.99	0	1.3	0	84	1	0.52	0	1.9	0	150	0
BEA-BG-SS-SSB-03-01	0.71	0	1	0	1.3	0	80	0	0.52	0	1.9	0	150	0
BEA-BG-SS-SSB-03-01-D	0.7	0	1	0	1.3	0	79	0	0.52	0	1.9	0	150	0
BEA-BG-SS-SSB-04-01	0.88	0	1.2	0	1.6	0	98	0	0.65	0	2.4	0	180	0
BEA-BG-SS-SSB-04-01-D	0.79	0	1.1	0	1.4	0	89	0	0.58	0	2.1	0	170	0
BEA-BG-SS-SSB-05-01	0.7	0	1	0	1.3	0	79	0	0.52	0	1.9	0	150	0
BEA-BG-SS-SSB-06-01	0.7	0	1	0	1.3	0	79	0	0.52	0	1.9	0	150	0
BEA-BG-SS-SSB-07-01	0.76	0	1.1	0	1.4	0	86	0	0.56	0	2	0	160	0
BEA-BG-SS-SSB-08-01	0.72	0	1	0	1.3	0	81	0	0.53	0	1.9	0	150	0
BEA-BG-SS-SSB-09-01	0.71	0	1	0	1.3	0	79	0	0.52	0	1.9	0	150	0
BEA-BG-SS-SSB-10-01	0.71	0	1	0	1.3	0	80	0	0.52	0	1.9	0	150	0
SCS-01_0-1	0.249	0	0.189	0	0.261	0			0.316	0	1.87	0	980	1
SCS-01_2-3	0.257	0	0.195	0	0.269	0	51	0	0.326	0	1.93	0	39	0
SCS-02_0-1	0.249	0	0.189	0	0.261	0	49	0	0.316	0	1.87	0	37	0
SCS-02_2-3	0.27	0	0.205	0	0.283	0	54	0	0.342	0	2.03	0	41	0
SCS-03_0-1	0.251	0	0.191	0	0.263	0	50	0	0.319	0	1.89	0	38	0
SCS-03_2-3	0.26	0	0.197	0	0.273	0	52	0	0.33	0	1.96	0	39	0
SCS-04_0-1	2.42	1	0.191	0	0.263	0	50	0	0.319	0	1.89	0	38	0
SCS-04_2-3	0.257	0	0.195	0	0.269	0	51	0	0.326	0	1.93	0	39	0
SCS-05_0-1	0.241	0	0.182	0	0.252	0	48	0	0.305	0	1.81	0	36	0
SCS-05_2-3	0.257	0	0.195	0	0.27	0	51	0	0.327	0	1.94	0	39	0
SCS-06_0-1	4.47	1	0.184	0	0.255	0	48	0	0.308	0	1.83	0	37	0
SCS-06_2-3	0.246	0	0.186	0	0.258	0	49	0	0.312	0	1.85	0	37	0
SCS-07_0-1	0.254	0	0.193	0	0.266	0	51	0	0.323	0	1.91	0	38	0
SCS-07_2-3	0.254	0	0.193	0	0.266	0	51	0	0.323	0	1.91	0	38	0
SCS-08_0-1	0.254	0	0.193	0	0.266	0	50	0	0.323	0	1.91	0	38	0
SCS-08_2-3	0.263	0	0.2	0	0.276	0	52	0	0.334	0	1.98	0	40	0
SCS-09_0-1	0.243	0	0.184	0	0.255	0	48	0	0.308	0	1.83	0	37	0
SCS-09_2-3	0.24	0	0.182	0	0.252	0	48	0	0.305	0	1.81	0	36	0
SCS-10_0-1	0.26	0	0.197	0	0.273	0	52	0	0.33	0	1.96	0	39	0
SCS-10_2-3	0.27	0	0.205	0	0.283	0	54	0	0.342	0	2.03	0	41	0
SSA-01_0-1	0.284	0	0.215	0	0.297	0	56	0	0.36	0	2.13	0	43	0
SSA-01_0-1-D	0.243	0	0.184	0	0.255	0	48	0	0.309	0	1.83	0	37	0
SSA-01_2-3	0.224	0	0.17	0	0.234	0	44	0	0.284	0	1.68	0	34	0
SSA-02_0-1	0.257	0	0.195	0	0.269	0	51	0	0.326	0	1.03	1	39	0
SSA-02_0-1-D	0.26	0	0.197	0	0.273	0	52	0	0.33	0	1.96	0	39	0
SSA-02_2-3	0.28	0	0.212	0	0.293	0	56	0	0.355	0	2.11	0	42	0
SSA-03_0-1	13.6	1	5.45	1	6.53	1	48	0	0.308	0	1.83	0	37	0
SSA-03_0-1-D	0.243	0	0.185	0	0.255	0	48	0	0.309	0	1.83	0	37	0
SSA-03_2-3	0.238	0	0.18	0	0.249	0	47	0	0.302	0	1.79	0	36	0
SSA-04_0-1	0.243	0	0.184	0	0.255	0	48	0	0.308	0	1.83	0	37	0
SSA-04_0-1-D	0.243	0	0.185	0	0.255	0	48	0	0.309	0	1.83	0	37	0
SSA-04_2-3	0.246	0	0.187	0	0.258	0	49	0	0.312	0	1.85	0	37	0
SSA-05_0-1	0.246	0	0.187	0	0.258	0	49	0	0.312	0	1.85	0	37	0
SSA-05_2-3	0.238	0	0.181	0	0.249	0	47	0	0.302	0	1.79	0	36	0
SSA-06_0-1	0.254	0	0.193	0	0.266	0	50	0	0.323	0	1.91	0	38	0
SSA-06_2-3	0.254	0	0.193	0	0.266	0	51	0	0.323	0	1.91	0	38	0
SSA-07_0-1	0.233	0	0.177	0	0.244	0	46	0	0.296	0	1.75	0	35	0
SSA-07_2-3	0.236	0	0.179	0	0.247	0	47	0	0.299	0	1.77	0	35	0
SSA-08_0-1	0.246	0	0.186	0	0.257	0	49	0	0.312	0	1.85	0	37	0
SSA-08_2-3	0.251	0	0.191	0	0.263	0	50	0	0.319	0	1.89	0	38	0
SSA-09_0-1	0.246	0	0.186	0	0.258	0	49	0	0.312	0	1.85	0	37	0
SSA-09_2-3	0.246	0	0.186	0	0.258	0	49	0	0.312	0	1.85	0	37	0
SSA-10_0-1	0.24	0	0.182	0	0.252	0	48	0	0.305	0	1.81	0	36	0
SSA-10_2-3	0.24	0	0.182	0	0.252	0	48	0	0.305	0	1.81	0	36	0

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	IRON	D_IRON	LEAD	D_LEAD	MAGNESIUM	D_MAGNESIUM	MANGANESE	D_MANGANESE	MERCURY	D_MERCURY	METHOXYCHLOR	D_METHOXYCHLOR	METHYL ACETATE	D_METHYL ACETATE	NICKEL	D_NICKEL	PERCENT SOLIDS	D_PERCENT SOLIDS	PHENANTHRENE	D_PHENANTHRENE
BEA-BG-SB-SSB-01-03	4,280,000	1			348000	1	15100	1	40	1	1.4	0	1	0	1600	1	86	1	92	1
BEA-BG-SB-SSB-02-03	1,600,000	1	6200	1	159000	1	7600	1	70	1	1.4	0	1	0	2400	1	86	1	67	0
BEA-BG-SB-SSB-03-03	2,430,000	1	4400	1	171000	1	25900	1	10	0	1.5	0	1	0	1400	1	78	1	74	0
BEA-BG-SB-SSB-04-03	1,170,000	1	3500	1	101000	1	8700	1	10	0	1.5	0	1	0	1100	1	81	1	71	0
BEA-BG-SB-SSB-05-03	2,220,000	1	4600	1	177000	1	15700	1	10	0	1.4	0	1	0	1600	1	86	1	67	0
BEA-BG-SB-SSB-06-03	857,000	1	1200	1	100000	1	10500	1	10	0	13	0	1	0	480	1	93	1	62	0
BEA-BG-SB-SSB-07-03	5,020,000	1	3300	1					10	0	1.5	0	1	0	2600	1	80	1	72	0
BEA-BG-SB-SSB-08-03	3,020,000	1	4200	1	159000	1	5900	1	10	0	1.3	0	1	0	3300	1	92	1	63	0
BEA-BG-SB-SSB-09-03	3,680,000	1	3200	1	181000	1	9400	1	10	0	1.3	0	1	0	1200	1	92	1	63	0
BEA-BG-SB-SSB-10-03	724,000	1	2100	1	40700	1	5700	1	10	0	1.4	0	1	0	360	1	86	1	67	0
BEA-BG-SS-SSB-01-01	1,770,000	1			140000	1	14900	1	10	0	1.3	0	1	0	950	1	89	1	390	1
BEA-BG-SS-SSB-02-01	3,750,000	1							10	0	1.3	0	0.9	0			90	1	64	0
BEA-BG-SS-SSB-03-01	3,390,000	1	9600	1	304000	1	19000	1	40	1	1.3	0	0.9	0	1200	1	89	1	65	0
BEA-BG-SS-SSB-03-01-D	3,310,000	1	7000	1	198000	1	14600	1	10	0	1.3	0	0.9	0	1200	1	90	1	64	0
BEA-BG-SS-SSB-04-01	2,110,000	1	8300	1	218000	1	12800	1	10	0	1.7	0	1	0	1300	1			80	0
BEA-BG-SS-SSB-04-01-D	1,960,000	1	9100	1	204000	1	13800	1	10	0	1.5	0	1	0	1200	1	80	1	72	0
BEA-BG-SS-SSB-05-01	1,510,000	1	3700	1	138000	1	35700	1	40	1	1.3	0	1	0	980	1	90	1	64	0
BEA-BG-SS-SSB-06-01	1,490,000	1	3000	1	141000	1	34000	1	10	0	1.3	0	1	0	740	1	90	1	64	0
BEA-BG-SS-SSB-07-01	3,270,000	1	3900	1			22400	1	10	0	1.4	0	1	0	1700	1	83	1	70	0
BEA-BG-SS-SSB-08-01	5,820,000	1	6400	1	357000	1	21200	1	40	1	1.4	0	1	0	3200	1	88	1	66	0
BEA-BG-SS-SSB-09-01	2,480,000	1	4800	1	168000	1	10500	1	10	0	1.3	0	1	0	1500	1	90	1	64	0
BEA-BG-SS-SSB-10-01	1,890,000	1	3600	1	136000	1	8200	1	10	0	1.4	0	1	0	1100	1	89	1	65	0
SCS-01_0-1	1,700,000	1	3220	1	108000	1	13000	1	150	1	32.8	1	3	1	1110	1	89	1		
SCS-01_2-3			6300	1	298000	1	7500	1	310	1	1.31	0	0.87	0	2900	1	86	1	46	0
SCS-02_0-1	916,000	1	3650	1	61400	1	4470	1	190	1	1.27	0	0.65	0	1070	1	89	1	45	0
SCS-02_2-3			8600	1	308000	1	4800	1	99	1	1.38	0	1.1	0	800	1	82	1	49	0
SCS-03_0-1	1,670,000	1	7520	1	131000	1			230	1	1.28	0	0.75	0	1700	1	88	1	45	0
SCS-03_2-3	1,750,000	1	3700	1	145000	1	21700	1	69	1	1.33	0	0.77	0	990	1	85	1	47	0
SCS-04_0-1	4,340,000	1			195000	1	11800	1	240	1	1.28	0	0.72	0	1030	1	88	1	45	0
SCS-04_2-3	574,000	1	3200	1	48100	1	3800	1	120	1	1.31	0	1	0	650	1	86	1	46	0
SCS-05_0-1	978,000	1	1280	1	77700	1	15100	1	120	1	1.23	0	0.79	0	520	1	92	1	43	0
SCS-05_2-3	2,900,000	1	978	1	69100	1	7240	1	9.4	0	1.31	0	1	0	341	0	86	1	46	0
SCS-06_0-1	2,150,000	1	4290	1	176000	1	18900	1	190	1	1.24	0	0.99	0	1780	1	91	1	44	0
SCS-06_2-3	773,000	1	1580	1	48900	1	14600	1	59	1	1.25	0	0.9	0	314	1	90	1	44	0
SCS-07_0-1	2,090,000	1	6610	1	189000	1			540	1	1.3	0	1	0	1660	1	87	1	46	0
SCS-07_2-3	1,990,000	1	5500	1	174000	1	24500	1	260	1	1.3	0	1.1	0	1400	1	87	1	46	0
SCS-08_0-1	1,190,000	1	4530	1	86200	1			330	1	1.3	0	1	0	631	1	87	1	46	0
SCS-08_2-3	467,000	1	3500	1	77200	1	2800	1	150	1	1.34	0	0.9	0	420	1	84	1	48	0
SCS-09_0-1	1,130,000	1	6630	1	49100	1	18200	1			1.24	0	1.1	0	424	1	91	1	44	0
SCS-09_2-3	1,380,000	1	2400	1	70600	1	3000	1	140	1	1.23	0	1	0	520	1	92	1	43	0
SCS-10_0-1	1,420,000	1	3050	1	63200	1	3840	1	300	1	1.33	0	0.99	0	1250	1	85	1	47	0
SCS-10_2-3			5100	1	320000	1	5700	1	180	1	1.38	0	0.86	0	880	1	82	1	49	0
SSA-01_0-1	2,900,000	1	4070	1	164000	1	12800	1	390	1	1.45	0	0.98	0	2110	1	92	1	51	0
SSA-01_0-1-D	3,940,000	1	2940	1	143000	1	8920	1	8.9	0	1.24	0	0.95	0	1360	1	91	1	44	0
SSA-01_2-3	1,010,000	1	3500	1	74500	1	4290	1	8.2	0	1.14	0	0.78	0	1220	1	99	1	40	0
SSA-02_0-1	98,300	1	1250	1	6460	1	1900	1	9.1	0	2.11	1	0.78	0	346	0	86	1	46	0
SSA-02_0-1-D	152,000	1	4260	1	57800	1	2120	1	9.5	0	1.33	0	0.84	0	332	0	85	1	47	0
SSA-02_2-3	288,000	1	4470	1	89400	1	3580	1	94	1	1.43	0	0.77	0	573	1	79	1	51	0
SSA-03_0-1	2,970,000	1	4290	1	112000	1	14400	1	220	1	1.24	0	0.7	0	1050	1	91	1	44	0
SSA-03_0-1-D	3,200,000	1	4120	1	129000	1	10800	1	140	1	1.24	0	0.89	0	1200	1	91	1	44	0
SSA-03_2-3	409,000	1	4220	1	60500	1	7120	1	8.7	0	1.21	0	0.77	0	618	1	93	1	43	0
SSA-04_0-1	1,280,000	1	3350	1	101000	1	6130	1	140	1	1.24	0	0.78	0	686	1	91	1	44	0
SSA-04_0-1-D	2,190,000	1	4120	1	115000	1	24200	1	350	1	1.24	0	0.97	0	1120	1	91	1	44	0
SSA-04_2-3	1,320,000	1	7050	1	66600	1	3130	1	8.9	0	1.25	0	0.72	0	742	1	90	1	44	0
SSA-05_0-1	2,450,000	1	3450	1	126000	1	23100	1	230	1	1.25	0	0.79	0	1640	1	90	1	44	0
SSA-05_2-3	3,570,000	1	2890	1	191000	1	6180	1	8.8	0	1.21	0	0.81	0	1880	1	93	1	43	0
SSA-06_0-1	2,290,000	1	5460	1	141000	1	5790	1	160	1	1.3	0	0.7	0	1130	1	87	1	46	0
SSA-06_2-3	1,530,000	1	4430	1	140000	1	5390	1	220	1	1.3	0	0.7	0	1010	1	87	1	46	0
SSA-07_0-1	1,060,000	1	2330	1	85500	1	5490	1	8.3	0	1.19	0	0.81	0	500	1	95	1	42	0
SSA-07_2-3	335,000	1	1760	1	39900	1	3700	1	8.6	0	1.2	0	0.84	0	368	1	94	1	42	0
SSA-08_0-1	2,610,000	1	4270	1	143000	1	13400	1	370	1	1.25	0	0.74	0	1250	1	90	1	44	0
SSA-08_2-3	3,020,000	1	3640	1	179000	1	9980	1	250	1	1.28	0	0.72	0	1480	1	88	1	45	0
SSA-09_0-1	2,060,000	1	4380	1	154000	1	29300	1	270	1	1.25	0	1.9	1	1060	1	90	1	44	0
SSA-09_2-3	1,680,000	1	2480	1	78900	1	6890	1	74	1	1.25	0	0.98	0	323	0	90	1	44	0
SSA-10_0-1	3,500,000	1	2190	1	64700	1	4490	1	380	1	1.23	0	1	0	543	1	92	1	43	0
SSA-10_2-3	3,500,000	1	1120	1	114000	1	2540	1	8.7	0	1.23	0	0.97	0	587	1	92	1	43	0

Notes:
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Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	POTASSIUM	D_POTASSIUM	PYRENE	D_PYRENE	SELENIUM	D_SELENIUM	SILVER	D_SILVER	SODIUM	D_SODIUM	THALLIUM	D_THALLIUM	TOTAL DDD/DDE/DDT	D_TOTAL DDD/DDE/DDT	TOTAL_PAH*	D_TOTAL_PAH*
BEA-BG-SB-SSB-01-03	92400	1	280	1	340	1	10	0			30	0	12.5	1	1122	1
BEA-BG-SB-SSB-02-03	108000	1	84	0	380	1	10	0	1490	0	20	0	0.78	0	380	0
BEA-BG-SB-SSB-03-03	86100	1	93	0	110	0	10	0	2030	0	20	0	0.86	0	420	0
BEA-BG-SB-SSB-04-03	2100	0	88	0	110	0	10	0	2030	0	20	0	0.82	0	400	0
BEA-BG-SB-SSB-05-03	125000	1	83	0	100	0	10	0	1740	0	20	0	0.77	0	380	0
BEA-BG-SB-SSB-06-03	62100	1	78	0	190	1	10	0	1610	0	20	0	7.2	0	360	0
BEA-BG-SB-SSB-07-03			90	0	290	1	10	0	81200	1	20	0	0.83	0	410	0
BEA-BG-SB-SSB-08-03	96400	1	78	0	110	0	10	0	102000	1	20	0	0.73	0	360	0
BEA-BG-SB-SSB-09-03	83900	1	78	0	220	1	10	0	1930	0	20	0	0.72	0	360	0
BEA-BG-SB-SSB-10-03	1580	0	84	0	440	1	140	1	1520	0	20	0	0.78	0	380	0
BEA-BG-SS-SSB-01-01	77300	1	1100	1	230	1	10	0	1390	0	20	0	7.6	1	4087	1
BEA-BG-SS-SSB-02-01			80	0	110	0	10	0	1980	0	20	0	0.74	0	142	1
BEA-BG-SS-SSB-03-01	104000	1	81	0	230	1	10	0	121000	1	20	0	0.75	0	370	0
BEA-BG-SS-SSB-03-01-D	84700	1	80	0	360	1	10	0	2110	0	20	0	0.74	0	370	0
BEA-BG-SS-SSB-04-01	99200	1	100	0	130	0	10	0	2400	0	30	0	0.92	0	460	0
BEA-BG-SS-SSB-04-01-D	101000	1	90	0	350	1	10	0	1970	0	20	0	0.83	0	410	0
BEA-BG-SS-SSB-05-01	93000	1	80	0	120	0	10	0	2170	0	30	0	0.74	0	370	0
BEA-BG-SS-SSB-06-01	99200	1	80	0	150	1	10	0	2040	0	20	0	0.74	0	370	0
BEA-BG-SS-SSB-07-01			87	0	400	1	10	0			20	0	0.8	0	400	0
BEA-BG-SS-SSB-08-01			82	0	370	1	10	0	1680	0	20	0	0.76	0	380	0
BEA-BG-SS-SSB-09-01	110000	1	80	0	210	1	10	0	1470	0	20	0	0.74	0	370	0
BEA-BG-SS-SSB-10-01	74400	1	81	0	150	1	10	0	1620	0	20	0	0.75	0	370	0
SCS-01_0-1	45200	1	3500	1	640	0	110	0	40200	0	386	1	0.333	0		
SCS-01_2-3			43	0	1400	1	114	0	52300	1	386	0	0.344	0	390	0
SCS-02_0-1	31300	1	41	0	628	0	108	0	39400	0	379	1	0.333	0	370	0
SCS-02_2-3	149000	1	45	0	1000	1	119	0	43400	0	406	0	0.361	0	410	0
SCS-03_0-1	121000	1	42	0	618	0	107	0	38800	0	362	0	0.336	0	380	0
SCS-03_2-3	117000	1	43	0	650	0	112	0	44200	1	381	0	0.348	0	390	0
SCS-04_0-1	68200	1	42	0	628	0	108	0	50400	1			10.28	1	380	0
SCS-04_2-3	30200	1	43	0	655	0	113	0	41100	0	384	0	0.344	0	390	0
SCS-05_0-1	40100	1	40	0	615	0	106	0	38600	0	361	0	0.322	0	360	0
SCS-05_2-3	53600	1	43	0	660	0	114	0	43500	1	387	0	0.344	0	390	0
SCS-06_0-1	86600	1	40	0	616	0	106	0	38600	0	361	0	0.325	0	370	0
SCS-06_2-3	32900	1	41	0	606	0	105	0	42600	1	355	0	0.329	0	370	0
SCS-07_0-1	84000	1	42	0	656	0	113	0	41200	0	385	0	0.34	0	380	0
SCS-07_2-3	92800	1	42	0	657	0	113	0	41200	0	385	0	0.34	0	380	0
SCS-08_0-1	64500	1	42	0	654	0	113	0	41000	0	383	0	0.34	0	380	0
SCS-08_2-3	67200	1	44	0	659	0	114	0	41300	0	386	0	0.352	0	400	0
SCS-09_0-1	39000	1	40	0	631	0	109	0	39600	0	370	0	0.325	0	370	0
SCS-09_2-3	38200	1	40	0	624	0	108	0	39200	0	366	0	0.322	0	360	0
SCS-10_0-1	36500	1	43	0	657	0	113	0	41300	0	385	0	0.348	0	390	0
SCS-10_2-3			45	0	1000	1	112	0	40700	0	380	0	0.361	0	410	0
SSA-01_0-1	64000	1	47	0	711	0	123	0	44600	0	417	0	0.379	0	430	0
SSA-01_0-1-D	53400	1	40	0	595	1	103	0	37300	0	349	0	0.326	0	370	0
SSA-01_2-3	37700	1	37	0	534	0	92	0	87100	1	313	0	0.299	0	340	0
SSA-02_0-1	13400	0	43	0	669	0	115	0	42000	0	392	0	4.03	1	390	0
SSA-02_0-1-D	44500	1	43	0	643	1	986	1	40300	0	377	0	0.348	0	390	0
SSA-02_2-3	62200	1	46	0	693	0	119	0	43500	0	406	0	0.375	0	420	0
SSA-03_0-1	46900	1	40	0	597	0	103	0	37500	0	350	0	12.1	1	370	0
SSA-03_0-1-D	55200	1	40	0	599	0	103	0	45300	1	351	0	0.326	0	370	0
SSA-03_2-3	36900	1	39	0	569	0	98.1	0	47500	1	334	0	0.318	0	360	0
SSA-04_0-1	37200	1	40	0	594	0	102	0	40000	1	348	0	0.325	0	370	0
SSA-04_0-1-D	42100	1	40	0	605	0	804	1	38000	0	355	0	0.326	0	370	0
SSA-04_2-3	38500	1	41	0	615	0	106	0	38600	0	360	0	0.329	0	370	0
SSA-05_0-1	53400	1	41	0	633	0	109	0	39700	0	371	0	0.329	0	370	0
SSA-05_2-3	86000	1	39	0	601	1	100	0	58500	1	340	0	0.319	0	360	0
SSA-06_0-1	93500	1	42	0	607	0	105	0	38100	0	356	0	2.93	1	380	0
SSA-06_2-3	70700	1	42	0	604	0	104	0	37900	0	354	0	0.34	0	380	0
SSA-07_0-1	39800	1	39	0	580	0	100	0	36400	0	340	0	0.312	0	350	0
SSA-07_2-3	19500	1	39	0	593	0	102	0	37200	0	348	0	0.315	0	350	0
SSA-08_0-1	65000	1	41	0	590	0	102	0	37000	0	346	0	0.329	0	370	0
SSA-08_2-3	87800	1	42	0	601	0	104	0	37700	0	353	0	0.336	0	380	0
SSA-09_0-1	67100	1	41	0	628	0	108	0	39400	0	368	0	0.329	0	370	0
SSA-09_2-3	35700	1	41	0	624	0	108	0	46300	1	366	0	0.329	0	370	0
SSA-10_0-1	32700	1	40	0	606	0	105	0	40300	1	355	0	0.322	0	360	0
SSA-10_2-3	52700	1	40	0	577	0	99.4	0	36200	0	338	0	0.322	0	360	0

Notes:
Units are microgram per kilogram (μg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C4
Soil Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLES	TRICHLOROFLUOROMETHANE	D_TRICHLOROFLUOROMETHANE	VANADIUM	D_VANADIUM	ZINC	D_ZINC
BEA-BG-SB-SSB-01-03	5	1	7600	1	14000	1
BEA-BG-SB-SSB-02-03	2	0	4900	1	2300	1
BEA-BG-SB-SSB-03-03	2	0	4800	1	2700	1
BEA-BG-SB-SSB-04-03	2	0	4200	1	190	0
BEA-BG-SB-SSB-05-03	2	0	5600	1	2700	1
BEA-BG-SB-SSB-06-03	2	0	2200	1	1600	1
BEA-BG-SB-SSB-07-03	2	0	11100	1	8800	1
BEA-BG-SB-SSB-08-03	2	0	6100	1	2700	1
BEA-BG-SB-SSB-09-03	2	0	8300	1	1900	1
BEA-BG-SB-SSB-10-03	2	0	3500	1	150	0
BEA-BG-SS-SSB-01-01	2	1	4300	1	9400	1
BEA-BG-SS-SSB-02-01	2	0	8000	1	18000	1
BEA-BG-SS-SSB-03-01	2	0	7800	1	5100	1
BEA-BG-SS-SSB-03-01-D	4	1	7900	1	5000	1
BEA-BG-SS-SSB-04-01	2	0	6300	1	5300	1
BEA-BG-SS-SSB-04-01-D	2	0	5800	1	7500	1
BEA-BG-SS-SSB-05-01	2	0	3200	1	3200	1
BEA-BG-SS-SSB-06-01	4	1	3200	1	3400	1
BEA-BG-SS-SSB-07-01	2	0	8000	1	6700	1
BEA-BG-SS-SSB-08-01	2	0	11500	1	5800	1
BEA-BG-SS-SSB-09-01	2	0	6800	1	3200	1
BEA-BG-SS-SSB-10-01	7	1	4300	1	2500	1
SCS-01_0-1	0.49	0	3610	1	1750	1
SCS-01_2-3	0.58	0			205	0
SCS-02_0-1	0.43	0	3290	1	2080	1
SCS-02_2-3	0.75	0			215	0
SCS-03_0-1	0.5	0	5030	1	9350	1
SCS-03_2-3	0.51	0	4900	1	202	0
SCS-04_0-1	0.48	0	10300	1	14400	1
SCS-04_2-3	0.68	0	2900	1	203	0
SCS-05_0-1	0.53	0	1770	1	191	0
SCS-05_2-3	0.68	0	4700	1	205	0
SCS-06_0-1	0.65	0	4090	1	191	0
SCS-06_2-3	0.6	0	2360	1	188	0
SCS-07_0-1	0.68	0	3890	1	11100	1
SCS-07_2-3	0.7	0	4000	1	204	0
SCS-08_0-1	0.68	0	4010	1	1830	1
SCS-08_2-3	0.6	0	3300	1	204	0
SCS-09_0-1	0.75	0	4450	1	2970	1
SCS-09_2-3	0.67	0	4500	1	194	0
SCS-10_0-1	0.66	0	5960	1	2100	1
SCS-10_2-3	0.57	0			201	0
SSA-01_0-1	0.65	0	5710	1	221	0
SSA-01_0-1-D	0.63	0	6490	1	185	0
SSA-01_2-3	0.52	0	5270	1	166	0
SSA-02_0-1	0.52	0	323	1	208	0
SSA-02_0-1-D	0.56	0	2750	1	199	0
SSA-02_2-3	0.51	0	3890	1	215	0
SSA-03_0-1	0.47	0	7120	1	185	0
SSA-03_0-1-D	0.59	0	7790	1	186	0
SSA-03_2-3	0.51	0	3180	1	177	0
SSA-04_0-1	0.52	0	3940	1	184	0
SSA-04_0-1-D	0.64	0	4090	1	188	0
SSA-04_2-3	0.48	0	4360	1	191	0
SSA-05_0-1	0.52	0	4410	1	196	0
SSA-05_2-3	0.54	0	11100	1	180	0
SSA-06_0-1	0.47	0	6000	1	188	0
SSA-06_2-3	0.47	0	5450	1	188	0
SSA-07_0-1	0.54	0	2660	1	180	0
SSA-07_2-3	0.56	0	1330	1	184	0
SSA-08_0-1	0.49	0	5280	1	183	0
SSA-08_2-3	0.48	0	5320	1	187	0
SSA-09_0-1	0.68	0	3980	1	195	0
SSA-09_2-3	0.65	0	3630	1	194	0
SSA-10_0-1	0.66	0	4900	1	188	0
SSA-10_2-3	0.64	0	5790	1	179	0

Notes:
Units are microgram per kilogram (µg/kg)
Table Formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Appendix C5
ProUCL Output, Distribution Recommendations, Soil UCL Calculations, Outliers Removed

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UCL Statistics for Soil Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	3/24/2015 8:53:17 AM
From File	C1 Soil ProUCL Dataset deleted outliers 03.23.xls
Full Precision	ON
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

4,4'-DDE

General Statistics

Total Number of Observations	66.000000	Number of Distinct Observations	31.000000
Number of Detects	4.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	4.0000000	Number of Distinct Non-Detects	27.000000
Minimum Detect	2.4000000	Minimum Non-Detect	0.1830000
Maximum Detect	12.100000	Maximum Non-Detect	5.4000000
Variance Detects	17.714692	Percent Non-Detects	93.939394%
Mean Detects	7.2025000	SD Detects	4.2088825
Median Detects	7.1550000	CV Detects	0.5843641
Skewness Detects	0.0521831	Kurtosis Detects	-1.540761
Mean of Logged Detects	1.8107436	SD of Logged Detects	0.7062469

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9893603	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1649042	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.4430000	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	0.6089660	Standard Error of Mean	0.2701453
SD	1.9003244	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1.0597401	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1.0533154	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.4194018	95% KM Chebyshev UCL	1.7865019
97.5% KM Chebyshev UCL	2.2960226	99% KM Chebyshev UCL	3.2968774

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.2309290	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.6592978	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2180318	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.3964753	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	3.2117011	k star (bias corrected MLE)	0.9695919
Theta hat (MLE)	2.2425810	Theta star (bias corrected MLE)	7.4283827
nu hat (MLE)	25.693609	nu star (bias corrected)	7.7567355
MLE Mean (bias corrected)	7.2025000	MLE Sd (bias corrected)	7.3145695

UCL Statistics for Soil Data Sets with Non-Detects			
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.1026906	nu hat (KM)	13.555158
Approximate Chi Square Value (13.56, α)	6.2679414	Adjusted Chi Square Value (13.56, β)	6.1570769
95% Gamma Approximate KM-UCL (use when n>=50)	1.3169604	95% Gamma Adjusted KM-UCL (use when n<50)	1.3406736
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.4459091
Maximum	12.100000	Median	0.0100000
SD	1.9514539	CV	4.3763492
k hat (MLE)	0.2136676	k star (bias corrected MLE)	0.2140565
Theta hat (MLE)	2.0869285	Theta star (bias corrected MLE)	2.0831374
nu hat (MLE)	28.204129	nu star (bias corrected)	28.255457
MLE Mean (bias corrected)	0.4459091	MLE Sd (bias corrected)	0.9637894
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (28.26, α)	17.127042	Adjusted Chi Square Value (28.26, β)	16.933226
95% Gamma Approximate UCL (use when n>=50)	0.7356416	95% Gamma Adjusted UCL (use when n<50)	N/A
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9546400	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2024331	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.4430000	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.5227310	Mean in Log Scale	-2.766822
SD in Original Scale	1.9372256	SD in Log Scale	1.6784457
95% t UCL (assumes normality of ROS data)	0.9206273	95% Percentile Bootstrap UCL	0.9634660
95% BCA Bootstrap UCL	1.1378272	95% Bootstrap t UCL	1.5792729
95% H-UCL (Log ROS)	0.4429475		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-1.484973	95% H-UCL (KM -Log)	0.4081602
KM SD (logged)	0.8514976	95% Critical H Value (KM-Log)	2.1431837
KM Standard Error of Mean (logged)	0.1211616		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.6265682	Mean in Log Scale	-1.681052
SD in Original Scale	1.9378467	SD in Log Scale	1.0841966
95% t UCL (Assumes normality)	1.0245920	95% H-Stat UCL	0.4542101
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			

UCL Statistics for Soil Data Sets with Non-Detects			
Suggested UCL to Use			
95% KM (t) UCL	1.0597401	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

4,4'-DDT

General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	36.000000
Number of Detects	5.0000000	Number of Non-Detects	61.000000
Number of Distinct Detects	5.0000000	Number of Distinct Non-Detects	31.000000
Minimum Detect	1.8000000	Minimum Non-Detect	0.2990000
Maximum Detect	5.2000000	Maximum Non-Detect	7.2000000
Variance Detects	1.9772300	Percent Non-Detects	92.424242%
Mean Detects	3.7660000	SD Detects	1.4061401
Median Detects	4.0300000	CV Detects	0.3733776
Skewness Detects	-0.580039	Kurtosis Detects	-1.238525
Mean of Logged Detects	1.2576616	SD of Logged Detects	0.4357196

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9407967	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1838107	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3962312	Detected Data appear Normal at 5% Significance Level
Detected Data appear Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	0.5656923	Standard Error of Mean	0.1369428
SD	0.9875085	95% KM (BCA) UCL	0.8307385
95% KM (t) UCL	0.7942000	95% KM (Percentile Bootstrap) UCL	0.7918923
95% KM (z) UCL	0.7909432	95% KM Bootstrap t UCL	0.6859647
90% KM Chebyshev UCL	0.9765207	95% KM Chebyshev UCL	1.1626121
97.5% KM Chebyshev UCL	1.4208998	99% KM Chebyshev UCL	1.9282559

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.3175794	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.6798031	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2213269	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.3579532	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	7.4778438	k star (bias corrected MLE)	3.1244709
Theta hat (MLE)	0.5036211	Theta star (bias corrected MLE)	1.2053241
nu hat (MLE)	74.778438	nu star (bias corrected)	31.244709
MLE Mean (bias corrected)	3.7660000	MLE Sd (bias corrected)	2.1305517

UCL Statistics for Soil Data Sets with Non-Detects			
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.3281548	nu hat (KM)	43.316439
Approximate Chi Square Value (43.32, α)	29.224912	Adjusted Chi Square Value (43.32, β)	28.966396
95% Gamma Approximate KM-UCL (use when n>=50)	0.8384551	95% Gamma Adjusted KM-UCL (use when n<50)	0.8459381
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.2945455
Maximum	5.2000000	Median	0.0100000
SD	1.0604994	CV	3.6004610
k hat (MLE)	0.2428366	k star (bias corrected MLE)	0.2418995
Theta hat (MLE)	1.2129371	Theta star (bias corrected MLE)	1.2176355
nu hat (MLE)	32.054425	nu star (bias corrected)	31.930739
MLE Mean (bias corrected)	0.2945455	MLE Sd (bias corrected)	0.5988731
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (31.93, α)	20.017118	Adjusted Chi Square Value (31.93, β)	19.806195
95% Gamma Approximate UCL (use when n>=50)	0.4698505	95% Gamma Adjusted UCL (use when n<50)	0.4748542
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9020439	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2226195	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.5619750	Mean in Log Scale	-1.190141
SD in Original Scale	1.0041647	SD in Log Scale	0.9333865
95% t UCL (assumes normality of ROS data)	0.7682253	95% Percentile Bootstrap UCL	0.7755881
95% BCA Bootstrap UCL	0.8326277	95% Bootstrap t UCL	0.8878982
95% H-UCL (Log ROS)	0.6075380		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-1.017698	95% H-UCL (KM -Log)	0.5314205
KM SD (logged)	0.6656739	95% Critical H Value (KM-Log)	1.9854956
KM Standard Error of Mean (logged)	0.0923124		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.5557955	Mean in Log Scale	-1.269369
SD in Original Scale	1.0772975	SD in Log Scale	0.8984894
95% t UCL (Assumes normality)	0.7770669	95% H-Stat UCL	0.5368735
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			

UCL Statistics for Soil Data Sets with Non-Detects			
Suggested UCL to Use			
95% KM (t) UCL	0.7942000	95% KM (Percentile Bootstrap) UCL	0.7918923

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

ALPHA-CHLORDANE

General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	42.000000
		Number of Missing Observations	3.0000000
Number of Detects	17.000000	Number of Non-Detects	46.000000
Number of Distinct Detects	17.000000	Number of Distinct Non-Detects	25.000000
Minimum Detect	0.8620000	Minimum Non-Detect	0.1450000
Maximum Detect	5.7100000	Maximum Non-Detect	0.6500000
Variance Detects	1.7240005	Percent Non-Detects	73.015873%
Mean Detects	2.9471765	SD Detects	1.3130120
Median Detects	2.5000000	CV Detects	0.4455152
Skewness Detects	0.5021058	Kurtosis Detects	-0.415259
Mean of Logged Detects	0.9783345	SD of Logged Detects	0.4861896

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9534680	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8920000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2041912	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2148866	Detected Data appear Normal at 5% Significance Level
Detected Data appear Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	0.9011429	Standard Error of Mean	0.1829647
SD	1.4088773	95% KM (BCA) UCL	1.2111905
95% KM (t) UCL	1.2066581	95% KM (Percentile Bootstrap) UCL	1.1996825
95% KM (z) UCL	1.2020930	95% KM Bootstrap t UCL	1.2547275
90% KM Chebyshev UCL	1.4500370	95% KM Chebyshev UCL	1.6986676
97.5% KM Chebyshev UCL	2.0437572	99% KM Chebyshev UCL	2.7216188

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.2845157	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7415290	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1510378	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.2097238	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	5.0381534	k star (bias corrected MLE)	4.1882832
Theta hat (MLE)	0.5849716	Theta star (bias corrected MLE)	0.7036717
nu hat (MLE)	171.29722	nu star (bias corrected)	142.40163

UCL Statistics for Soil Data Sets with Non-Detects			
MLE Mean (bias corrected)	2.9471765	MLE Sd (bias corrected)	1.4400850

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.4091108	nu hat (KM)	51.547965
Approximate Chi Square Value (51.55, α)	36.058483	Adjusted Chi Square Value (51.55, β)	35.755167
95% Gamma Approximate KM-UCL (use when n>=50)	1.2882428	95% Gamma Adjusted KM-UCL (use when n<50)	1.2991711

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.8380984
Maximum	5.7100000	Median	0.0100000
SD	1.4595728	CV	1.7415292
k hat (MLE)	0.2712186	k star (bias corrected MLE)	0.2688855
Theta hat (MLE)	3.0901212	Theta star (bias corrected MLE)	3.1169347
nu hat (MLE)	34.173546	nu star (bias corrected)	33.879567
MLE Mean (bias corrected)	0.8380984	MLE Sd (bias corrected)	1.6162605
		Adjusted Level of Significance (β)	0.0461905
Approximate Chi Square Value (33.88, α)	21.568153	Adjusted Chi Square Value (33.88, β)	21.337793
95% Gamma Approximate UCL (use when n>=50)	1.3164971	95% Gamma Adjusted UCL (use when n<50)	1.3307099

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9586398	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8920000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1231265	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2148866	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.2107031	Mean in Log Scale	-0.195900
SD in Original Scale	1.2679419	SD in Log Scale	0.8255153
95% t UCL (assumes normality of ROS data)	1.4774471	95% Percentile Bootstrap UCL	1.4944668
95% BCA Bootstrap UCL	1.5124223	95% Bootstrap t UCL	1.5235317
95% H-UCL (Log ROS)	1.4426386		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-1.145957	95% H-UCL (KM -Log)	1.1013936
KM SD (logged)	1.3144348	95% Critical H Value (KM-Log)	2.2683548
KM Standard Error of Mean (logged)	0.1706999		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.9150794	Mean in Log Scale	-1.187908
SD in Original Scale	1.4150579	SD in Log Scale	1.4468831
95% t UCL (Assumes normality)	1.2127729	95% H-Stat UCL	1.3518915
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics

UCL Statistics for Soil Data Sets with Non-Detects			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	1.2066581	95% KM (Percentile Bootstrap) UCL	1.1996825
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
ALUMINUM			
General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	58.000000
		Number of Missing Observations	3.0000000
Minimum	127000.00	Mean	3869603.2
Maximum	9360000.0	Median	4030000.0
SD	1749415.2	Std. Error of Mean	220405.60
Coefficient of Variation	0.4520916	Skewness	0.5111715
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9568701	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0634131	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1022129	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	4237637.3	95% Adjusted-CLT UCL (Chen-1995)	4247305.1
		95% Modified-t UCL (Johnson-1978)	4240003.1
Gamma GOF Test			
A-D Test Statistic	1.7724600	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7558422	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1502145	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.1128167	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.5485712	k star (bias corrected MLE)	3.3901737
Theta hat (MLE)	1090467.9	Theta star (bias corrected MLE)	1141417.4
nu hat (MLE)	447.11998	nu star (bias corrected)	427.16188
MLE Mean (bias corrected)	3869603.2	MLE Sd (bias corrected)	2101626.1
		Approximate Chi Square Value (0.05)	380.24834
Adjusted Level of Significance	0.0461905	Adjusted Chi Square Value	379.21859
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	4347019.6	95% Adjusted Gamma UCL (use when n<50)	4358823.7

UCL Statistics for Soil Data Sets with Non-Detects			
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8159339	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	1.886E-10	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1809637	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	11.751942	Mean of logged Data	15.021194
Maximum of Logged Data	16.051956	SD of logged Data	0.6596391
Assuming Lognormal Distribution			
95% H-UCL	4897915.6	90% Chebyshev (MVUE) UCL	5254822.8
95% Chebyshev (MVUE) UCL	5762824.9	97.5% Chebyshev (MVUE) UCL	6467912.1
99% Chebyshev (MVUE) UCL	7852919.4		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	4232138.1	95% Jackknife UCL	4237637.3
95% Standard Bootstrap UCL	4238133.6	95% Bootstrap-t UCL	4267569.2
95% Hall's Bootstrap UCL	4278538.8	95% Percentile Bootstrap UCL	4226063.5
95% BCA Bootstrap UCL	4241015.9		
90% Chebyshev(Mean, Sd) UCL	4530820.0	95% Chebyshev(Mean, Sd) UCL	4830328.9
97.5% Chebyshev(Mean, Sd) UCL	5246035.7	99% Chebyshev(Mean, Sd) UCL	6062611.2
Suggested UCL to Use			
95% Student's-t UCL	4237637.3		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
ARSENIC			
General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	60.000000
		Number of Missing Observations	1.0000000
Number of Detects	48.000000	Number of Non-Detects	17.000000
Number of Distinct Detects	43.000000	Number of Distinct Non-Detects	17.000000
Minimum Detect	250.00000	Minimum Non-Detect	60.000000
Maximum Detect	2400.0000	Maximum Non-Detect	669.00000
Variance Detects	208924.90	Percent Non-Detects	26.153846%
Mean Detects	1037.1042	SD Detects	457.08304
Median Detects	939.00000	CV Detects	0.4407301
Skewness Detects	1.0394077	Kurtosis Detects	1.3088308
Mean of Logged Detects	6.8502153	SD of Logged Detects	0.4481968

UCL Statistics for Soil Data Sets with Non-Detects			
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9315591	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9470000	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1399250	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1278831	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	824.75646	Standard Error of Mean	69.392227
SD	538.52521	95% KM (BCA) UCL	931.00000
95% KM (t) UCL	940.57299	95% KM (Percentile Bootstrap) UCL	945.56643
95% KM (z) UCL	938.89651	95% KM Bootstrap t UCL	941.63822
90% KM Chebyshev UCL	1032.9331	95% KM Chebyshev UCL	1127.2302
97.5% KM Chebyshev UCL	1258.1108	99% KM Chebyshev UCL	1515.2004
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.2416902	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7530630	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0834653	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1281743	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	5.4819511	k star (bias corrected MLE)	5.1532181
Theta hat (MLE)	189.18523	Theta star (bias corrected MLE)	201.25369
nu hat (MLE)	526.26731	nu star (bias corrected)	494.70893
MLE Mean (bias corrected)	1037.1042	MLE Sd (bias corrected)	456.85998
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	2.3455213	nu hat (KM)	304.91776
Approximate Chi Square Value (304.92, α)	265.46675	Adjusted Chi Square Value (304.92, β)	264.63693
95% Gamma Approximate KM-UCL (use when n>=50)	947.32353	95% Gamma Adjusted KM-UCL (use when n<50)	950.29402
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	161.33856	Mean	842.89190
Maximum	2400.0000	Median	844.00000
SD	513.42915	CV	0.6091281
k hat (MLE)	2.5826138	k star (bias corrected MLE)	2.4736726
Theta hat (MLE)	326.37164	Theta star (bias corrected MLE)	340.74513
nu hat (MLE)	335.73979	nu star (bias corrected)	321.57744
MLE Mean (bias corrected)	842.89190	MLE Sd (bias corrected)	535.92099
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (321.58, α)	281.03072	Adjusted Chi Square Value (321.58, β)	280.17634
95% Gamma Approximate UCL (use when n>=50)	964.50319	95% Gamma Adjusted UCL (use when n<50)	967.44436

UCL Statistics for Soil Data Sets with Non-Detects			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9833542	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.9470000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0887819	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1278831	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	869.76406	Mean in Log Scale	6.6212400
SD in Original Scale	484.24381	SD in Log Scale	0.5507835
95% t UCL (assumes normality of ROS data)	970.01008	95% Percentile Bootstrap UCL	968.54869
95% BCA Bootstrap UCL	970.86030	95% Bootstrap t UCL	977.73017
95% H-UCL (Log ROS)	995.91431		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	6.3440354	95% H-UCL (KM -Log)	1356.0434
KM SD (logged)	1.0645972	95% Critical H Value (KM-Log)	2.2664539
KM Standard Error of Mean (logged)	0.1538373		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	826.88462	Mean in Log Scale	6.4083211
SD in Original Scale	533.06606	SD in Log Scale	0.9629903
95% t UCL (Assumes normality)	937.23760	95% H-Stat UCL	1262.1090
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (Percentile Bootstrap) UCL	945.56643	95% GROS Approximate Gamma UCL	964.50319
95% Approximate Gamma KM-UCL	947.32353		
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
BARIUM			
General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	57.000000
		Number of Missing Observations	0
Minimum	681.00000	Mean	11213.348
Maximum	32500.000	Median	10900.000
SD	6790.8212	Std. Error of Mean	835.89230
Coefficient of Variation	0.6056015	Skewness	1.0388639
Normal GOF Test			

UCL Statistics for Soil Data Sets with Non-Detects			
Shapiro Wilk Test Statistic	0.9201761	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	2.6819E-4	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0875435	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1090591	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	12608.148	95% Adjusted-CLT UCL (Chen-1995)	12702.482
		95% Modified-t UCL (Johnson-1978)	12625.963
Gamma GOF Test			
A-D Test Statistic	0.4096513	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7599986	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0764992	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1107596	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.5803794	k star (bias corrected MLE)	2.4731904
Theta hat (MLE)	4345.6201	Theta star (bias corrected MLE)	4533.9608
nu hat (MLE)	340.61008	nu star (bias corrected)	326.46114
MLE Mean (bias corrected)	11213.348	MLE Sd (bias corrected)	7130.2793
		Approximate Chi Square Value (0.05)	285.59863
Adjusted Level of Significance	0.0463636	Adjusted Chi Square Value	284.75062
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	12817.717	95% Adjusted Gamma UCL (use when n<50)	12855.890
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9502410	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0224926	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1134559	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1090591	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	6.5235623	Mean of logged Data	9.1187508
Maximum of Logged Data	10.388995	SD of logged Data	0.7072789
Assuming Lognormal Distribution			
95% H-UCL	13988.411	90% Chebyshev (MVUE) UCL	15017.429
95% Chebyshev (MVUE) UCL	16536.824	97.5% Chebyshev (MVUE) UCL	18645.687
99% Chebyshev (MVUE) UCL	22788.138		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	12588.269	95% Jackknife UCL	12608.148

UCL Statistics for Soil Data Sets with Non-Detects			
95% Standard Bootstrap UCL	12578.432	95% Bootstrap-t UCL	12712.734
95% Hall's Bootstrap UCL	12734.718	95% Percentile Bootstrap UCL	12585.455
95% BCA Bootstrap UCL	12683.197		
90% Chebyshev(Mean, Sd) UCL	13721.025	95% Chebyshev(Mean, Sd) UCL	14856.919
97.5% Chebyshev(Mean, Sd) UCL	16433.494	99% Chebyshev(Mean, Sd) UCL	19530.372

Suggested UCL to Use	
95% Student's-t UCL	12608.148

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

BENZO(A)ANTHRACENE

General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	22.000000
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	19.000000
Minimum Detect	150.00000	Minimum Non-Detect	26.000000
Maximum Detect	2200.0000	Maximum Non-Detect	82.000000
Variance Detects	1202500.0	Percent Non-Detects	95.454545%
Mean Detects	950.00000	SD Detects	1096.5856
Median Detects	500.00000	CV Detects	1.1543006
Skewness Detects	1.5356682	Kurtosis Detects	N/A
Mean of Logged Detects	6.3071520	SD of Logged Detects	1.3451783

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8736839	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3258974	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	68.000000	Standard Error of Mean	40.866577
SD	271.07821	95% KM (BCA) UCL	N/A
95% KM (t) UCL	136.19144	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	135.21954	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	190.59973	95% KM Chebyshev UCL	246.13328
97.5% KM Chebyshev UCL	323.21169	99% KM Chebyshev UCL	474.61731

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

UCL Statistics for Soil Data Sets with Non-Detects			
k hat (MLE)	1.0454100	k star (bias corrected MLE)	N/A
Theta hat (MLE)	908.73439	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.2724599	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.0629258	nu hat (KM)	8.3062032
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (8.31, α)	2.9135928	Adjusted Chi Square Value (8.31, β)	2.8426454
95% Gamma Approximate KM-UCL (use when n>=50)	193.85750	95% Gamma Adjusted KM-UCL (use when n<50)	198.69584

Gamma (KM) may not be used when k hat (KM) is < 0.1

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9964311	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1940910	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	43.426671	Mean in Log Scale	-5.480900
SD in Original Scale	277.02023	SD in Log Scale	4.5066800
95% t UCL (assumes normality of ROS data)	100.32521	95% Percentile Bootstrap UCL	107.97803
95% BCA Bootstrap UCL	153.33940	95% Bootstrap t UCL	660.26176
95% H-UCL (Log ROS)	3024.6223		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.3966900	95% H-UCL (KM -Log)	44.400096
KM SD (logged)	0.6769080	95% Critical H Value (KM-Log)	1.9943933
KM Standard Error of Mean (logged)	0.1020477		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	63.000000	Mean in Log Scale	3.0963545
SD in Original Scale	274.09319	SD in Log Scale	0.8453938
95% t UCL (Assumes normality)	119.29734	95% H-Stat UCL	39.561059

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	136.19144	95% KM (Percentile Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Soil Data Sets with Non-Detects

BENZO(A)PYRENE

General Statistics

Total Number of Observations	66.000000	Number of Distinct Observations	22.000000
Number of Detects	4.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	4.0000000	Number of Distinct Non-Detects	19.000000
Minimum Detect	58.000000	Minimum Non-Detect	36.000000
Maximum Detect	1400.0000	Maximum Non-Detect	63.000000
Variance Detects	372107.67	Percent Non-Detects	93.939394%
Mean Detects	539.50000	SD Detects	610.00628
Median Detects	350.00000	CV Detects	1.1306882
Skewness Detects	1.3829756	Kurtosis Detects	1.4924294
Mean of Logged Detects	5.6678534	SD of Logged Detects	1.3915236

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8708002	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2496730	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.4430000	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	66.520528	Standard Error of Mean	25.164950
SD	177.05078	95% KM (BCA) UCL	N/A
95% KM (t) UCL	108.51167	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	107.91319	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	142.01538	95% KM Chebyshev UCL	176.21200
97.5% KM Chebyshev UCL	223.67559	99% KM Chebyshev UCL	316.90862

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.2312920	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.6675786	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2283890	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.4031167	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.9343762	k star (bias corrected MLE)	0.4002607
Theta hat (MLE)	577.39056	Theta star (bias corrected MLE)	1347.8715
nu hat (MLE)	7.4750096	nu star (bias corrected)	3.2020857
MLE Mean (bias corrected)	539.50000	MLE Sd (bias corrected)	852.74654

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.1411613	nu hat (KM)	18.633293
Approximate Chi Square Value (18.63, α)	9.8500893	Adjusted Chi Square Value (18.63, β)	9.7071177
95% Gamma Approximate KM-UCL (use when n>=50)	125.83606	95% Gamma Adjusted KM-UCL (use when n<50)	127.68945

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 detected data is small such as < 0.1

UCL Statistics for Soil Data Sets with Non-Detects			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	32.706364
Maximum	1400.0000	Median	0.0100000
SD	184.38936	CV	5.6377213
k hat (MLE)	0.1076909	k star (bias corrected MLE)	0.1128969
Theta hat (MLE)	303.70594	Theta star (bias corrected MLE)	289.70126
nu hat (MLE)	14.215198	nu star (bias corrected)	14.902386
MLE Mean (bias corrected)	32.706364	MLE Sd (bias corrected)	97.339996
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (14.90, α)	7.1937017	Adjusted Chi Square Value (14.90, β)	7.0738285
95% Gamma Approximate UCL (use when n>=50)	67.754109	95% Gamma Adjusted UCL (use when n<50)	N/A

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9848693	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1730046	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.4430000	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	32.968620	Mean in Log Scale	-3.663224
SD in Original Scale	184.34395	SD in Log Scale	3.7400385
95% t UCL (assumes normality of ROS data)	70.831924	95% Percentile Bootstrap UCL	76.346615
95% BCA Bootstrap UCL	110.46208	95% Bootstrap t UCL	317.02526
95% H-UCL (Log ROS)	267.16377		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.7099588	95% H-UCL (KM -Log)	55.455554
KM SD (logged)	0.5791234	95% Critical H Value (KM-Log)	1.9202061
KM Standard Error of Mean (logged)	0.0823198		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	53.545455	Mean in Log Scale	3.2470336
SD in Original Scale	180.70211	SD in Log Scale	0.6998158
95% t UCL (Assumes normality)	90.660744	95% H-Stat UCL	39.119575
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	108.51167	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Soil Data Sets with Non-Detects

BENZO(B)FLUORANTHENE

General Statistics

Total Number of Observations	65.000000	Number of Distinct Observations	24.000000
		Number of Missing Observations	1.0000000
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	22.000000
Minimum Detect	89.000000	Minimum Non-Detect	34.000000
Maximum Detect	540.00000	Maximum Non-Detect	89.000000
Variance Detects	56017.000	Percent Non-Detects	95.384615%
Mean Detects	273.00000	SD Detects	236.67911
Median Detects	190.00000	CV Detects	0.8669564
Skewness Detects	1.3840122	Kurtosis Detects	N/A
Mean of Logged Detects	5.3424099	SD of Logged Detects	0.9052433

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9077472	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3037546	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	45.030769	Standard Error of Mean	9.8897102
SD	65.102043	95% KM (BCA) UCL	N/A
95% KM (t) UCL	61.536824	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	61.297895	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	74.699900	95% KM Chebyshev UCL	88.139017
97.5% KM Chebyshev UCL	106.79199	99% KM Chebyshev UCL	143.43214

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	2.0230544	k star (bias corrected MLE)	N/A
Theta hat (MLE)	134.94446	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	12.138327	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.4784422	nu hat (KM)	62.197489
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (62.20, α)	45.057290	Adjusted Chi Square Value (62.20, β)	44.726782
95% Gamma Approximate KM-UCL (use when n>=50)	62.160880	95% Gamma Adjusted KM-UCL (use when n<50)	62.620216

UCL Statistics for Soil Data Sets with Non-Detects			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9916538	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2086257	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	13.069747	Mean in Log Scale	-2.549263
SD in Original Scale	71.221996	SD in Log Scale	2.8944835
95% t UCL (assumes normality of ROS data)	27.813810	95% Percentile Bootstrap UCL	28.720156
95% BCA Bootstrap UCL	39.502487	95% Bootstrap t UCL	86.420628
95% H-UCL (Log ROS)	19.699913		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.6101782	95% H-UCL (KM -Log)	44.207657
KM SD (logged)	0.4128025	95% Critical H Value (KM-Log)	1.8123312
KM Standard Error of Mean (logged)	0.0627092		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	36.000000	Mean in Log Scale	3.2465774
SD in Original Scale	67.703974	SD in Log Scale	0.5832452
95% t UCL (Assumes normality)	50.015778	95% H-Stat UCL	35.050358
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	61.536824	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
BENZO(K)FLUORANTHENE			
General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	23.000000
		Number of Missing Observations	1.0000000
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	66.000000	Minimum Non-Detect	42.000000
Maximum Detect	520.00000	Maximum Non-Detect	81.000000
Variance Detects	56572.000	Percent Non-Detects	95.384615%
Mean Detects	252.00000	SD Detects	237.84869
Median Detects	170.00000	CV Detects	0.9438440

UCL Statistics for Soil Data Sets with Non-Detects			
Skewness Detects	1.3670104	Kurtosis Detects	N/A
Mean of Logged Detects	5.1930940	SD of Logged Detects	1.0332791

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9108395	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3015281	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	51.761974	Standard Error of Mean	9.2208635
SD	60.683090	95% KM (BCA) UCL	N/A
95% KM (t) UCL	67.151715	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	66.928945	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	79.424564	95% KM Chebyshev UCL	91.954786
97.5% KM Chebyshev UCL	109.34625	99% KM Chebyshev UCL	143.50841

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.6333787	k star (bias corrected MLE)	N/A
Theta hat (MLE)	154.28143	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.8002720	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.7275893	nu hat (KM)	94.586605
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (94.59, α)	73.155955	Adjusted Chi Square Value (94.59, β)	72.729642
95% Gamma Approximate KM-UCL (use when n>=50)	66.925370	95% Gamma Adjusted KM-UCL (use when n<50)	67.317661

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9976748	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1887768	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	12.132804	Mean in Log Scale	-2.143001
SD in Original Scale	67.801099	SD in Log Scale	2.6650362
95% t UCL (assumes normality of ROS data)	26.168688	95% Percentile Bootstrap UCL	27.174235
95% BCA Bootstrap UCL	39.966275	95% Bootstrap t UCL	102.95459
95% H-UCL (Log ROS)	12.629097		

UCL Statistics for Soil Data Sets with Non-Detects			
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.8061551	95% H-UCL (KM -Log)	51.864673
KM SD (logged)	0.3556963	95% Critical H Value (KM-Log)	1.7818099
KM Standard Error of Mean (logged)	0.0541816		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	37.200000	Mean in Log Scale	3.3602666
SD in Original Scale	63.728538	SD in Log Scale	0.4795901
95% t UCL (Assumes normality)	50.392801	95% H-Stat UCL	36.100145
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	67.151715	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
BERYLLIUM			
General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	43.000000
		Number of Missing Observations	3.0000000
Number of Detects	39.000000	Number of Non-Detects	24.000000
Number of Distinct Detects	27.000000	Number of Distinct Non-Detects	18.000000
Minimum Detect	60.000000	Minimum Non-Detect	10.000000
Maximum Detect	190.00000	Maximum Non-Detect	92.300000
Variance Detects	1170.1043	Percent Non-Detects	38.095238%
Mean Detects	117.42051	SD Detects	34.206787
Median Detects	110.00000	CV Detects	0.2913187
Skewness Detects	0.5623513	Kurtosis Detects	-0.664214
Mean of Logged Detects	4.7252262	SD of Logged Detects	0.2882158
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9336389	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.9390000	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1411554	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1418735	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Approximate Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	84.365885	Standard Error of Mean	7.4855149
SD	53.257865	95% KM (BCA) UCL	95.693854

UCL Statistics for Soil Data Sets with Non-Detects			
95% KM (t) UCL	96.865229	95% KM (Percentile Bootstrap) UCL	96.535153
95% KM (z) UCL	96.678462	95% KM Bootstrap t UCL	96.754737
90% KM Chebyshev UCL	106.82243	95% KM Chebyshev UCL	116.99449
97.5% KM Chebyshev UCL	131.11291	99% KM Chebyshev UCL	158.84582
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.5420040	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7477406	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1057173	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1411700	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	12.499271	k star (bias corrected MLE)	11.554883
Theta hat (MLE)	9.3941887	Theta star (bias corrected MLE)	10.161982
nu hat (MLE)	974.94316	nu star (bias corrected)	901.28087
MLE Mean (bias corrected)	117.42051	MLE Sd (bias corrected)	34.543091
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	2.5093788	nu hat (KM)	316.18173
Approximate Chi Square Value (316.18, α)	275.98670	Adjusted Chi Square Value (316.18, β)	275.11250
95% Gamma Approximate KM-UCL (use when n>=50)	96.653033	95% Gamma Adjusted KM-UCL (use when n<50)	96.960161
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	21.539714	Mean	93.133034
Maximum	190.00000	Median	84.800000
SD	41.642056	CV	0.4471244
k hat (MLE)	5.0888861	k star (bias corrected MLE)	4.8571402
Theta hat (MLE)	18.301261	Theta star (bias corrected MLE)	19.174459
nu hat (MLE)	641.19965	nu star (bias corrected)	611.99967
MLE Mean (bias corrected)	93.133034	MLE Sd (bias corrected)	42.258437
		Adjusted Level of Significance (β)	0.0461905
Approximate Chi Square Value (612.00, α)	555.61257	Adjusted Chi Square Value (612.00, β)	554.36343
95% Gamma Approximate UCL (use when n>=50)	102.58477	95% Gamma Adjusted UCL (use when n<50)	102.81592
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9651926	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9390000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0953871	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1418735	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	96.122614	Mean in Log Scale	4.4915509
SD in Original Scale	38.542385	SD in Log Scale	0.3836654
95% t UCL (assumes normality of ROS data)	104.23099	95% Percentile Bootstrap UCL	103.86039

UCL Statistics for Soil Data Sets with Non-Detects			
95% BCA Bootstrap UCL	104.04490	95% Bootstrap t UCL	104.95607
95% H-UCL (Log ROS)	104.85757		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	4.0464070	95% H-UCL (KM -Log)	136.98788
KM SD (logged)	1.0641941	95% Critical H Value (KM-Log)	2.2732124
KM Standard Error of Mean (logged)	0.1679039		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	85.302381	Mean in Log Scale	4.1490835
SD in Original Scale	50.241759	SD in Log Scale	0.9652781
95% t UCL (Assumes normality)	95.872018	95% H-Stat UCL	132.73694

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Detected Data appear Approximate Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	96.865229	95% KM (Percentile Bootstrap) UCL	96.535153

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CADMIUM

General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	41.000000
Number of Detects	5.0000000	Number of Non-Detects	61.000000
Number of Distinct Detects	5.0000000	Number of Distinct Non-Detects	36.000000
Minimum Detect	66.500000	Minimum Non-Detect	10.000000
Maximum Detect	320.00000	Maximum Non-Detect	73.500000
Variance Detects	12756.423	Percent Non-Detects	92.424242%
Mean Detects	161.64000	SD Detects	112.94434
Median Detects	110.00000	CV Detects	0.6987400
Skewness Detects	0.7883730	Kurtosis Detects	-1.692769
Mean of Logged Detects	4.8838266	SD of Logged Detects	0.7101613

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8567709	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2762422	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3962312	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	21.729793	Standard Error of Mean	6.7533298
SD	48.900890	95% KM (BCA) UCL	33.851893

UCL Statistics for Soil Data Sets with Non-Detects			
95% KM (t) UCL	32.998642	95% KM (Percentile Bootstrap) UCL	33.194310
95% KM (z) UCL	32.838032	95% KM Bootstrap t UCL	32.863698
90% KM Chebyshev UCL	41.989783	95% KM Chebyshev UCL	51.166875
97.5% KM Chebyshev UCL	63.904324	99% KM Chebyshev UCL	88.924576
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4207286	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.6832932	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2460244	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.3598026	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.6355927	k star (bias corrected MLE)	1.1875704
Theta hat (MLE)	61.329658	Theta star (bias corrected MLE)	136.10982
nu hat (MLE)	26.355927	nu star (bias corrected)	11.875704
MLE Mean (bias corrected)	161.64000	MLE Sd (bias corrected)	148.32664
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.1974593	nu hat (KM)	26.064632
Approximate Chi Square Value (26.06, α)	15.429122	Adjusted Chi Square Value (26.06, β)	15.246028
95% Gamma Approximate KM-UCL (use when n>=50)	36.708444	95% Gamma Adjusted KM-UCL (use when n<50)	37.149286
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	12.254697
Maximum	320.00000	Median	0.0100000
SD	51.403595	CV	4.1946035
k hat (MLE)	0.1235682	k star (bias corrected MLE)	0.1280525
Theta hat (MLE)	99.173538	Theta star (bias corrected MLE)	95.700577
nu hat (MLE)	16.311004	nu star (bias corrected)	16.902928
MLE Mean (bias corrected)	12.254697	MLE Sd (bias corrected)	34.245899
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (16.90, α)	8.6029104	Adjusted Chi Square Value (16.90, β)	8.4703462
95% Gamma Approximate UCL (use when n>=50)	24.077929	95% Gamma Adjusted UCL (use when n<50)	24.454758
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8843794	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2053372	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	15.212629	Mean in Log Scale	0.9755242
SD in Original Scale	50.881126	SD in Log Scale	1.5090026
95% t UCL (assumes normality of ROS data)	25.663352	95% Percentile Bootstrap UCL	25.678963

UCL Statistics for Soil Data Sets with Non-Detects			
95% BCA Bootstrap UCL	30.492929	95% Bootstrap t UCL	45.733391
95% H-UCL (Log ROS)	13.032312		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	2.5062216	95% H-UCL (KM -Log)	18.915422
KM SD (logged)	0.7135934	95% Critical H Value (KM-Log)	2.0240367
KM Standard Error of Mean (logged)	0.0999986		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	34.190909	Mean in Log Scale	3.0422484
SD in Original Scale	47.834127	SD in Log Scale	1.0064064
95% t UCL (Assumes normality)	44.015794	95% H-Stat UCL	46.068011

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	32.998642	95% KM (Percentile Bootstrap) UCL	33.194310

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CALCIUM

General Statistics			
Total Number of Observations	62.000000	Number of Distinct Observations	53.000000
		Number of Missing Observations	4.0000000
Number of Detects	35.000000	Number of Non-Detects	27.000000
Number of Distinct Detects	34.000000	Number of Distinct Non-Detects	19.000000
Minimum Detect	39900.000	Minimum Non-Detect	970.00000
Maximum Detect	1390000.0	Maximum Non-Detect	15100.000
Variance Detects	1.148E+11	Percent Non-Detects	43.548387%
Mean Detects	488160.00	SD Detects	338786.21
Median Detects	406000.00	CV Detects	0.6940065
Skewness Detects	1.1394319	Kurtosis Detects	0.8394533
Mean of Logged Detects	12.835402	SD of Logged Detects	0.8062397

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8914575	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9340000	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1995610	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1497613	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	275996.61	Standard Error of Mean	44876.125

UCL Statistics for Soil Data Sets with Non-Detects			
SD	348270.45	95% KM (BCA) UCL	357209.68
95% KM (t) UCL	350949.59	95% KM (Percentile Bootstrap) UCL	352189.03
95% KM (z) UCL	349811.27	95% KM Bootstrap t UCL	360421.58
90% KM Chebyshev UCL	410624.99	95% KM Chebyshev UCL	471607.11
97.5% KM Chebyshev UCL	556247.93	99% KM Chebyshev UCL	722508.42
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.2984929	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7594034	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1101947	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1506072	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.0522398	k star (bias corrected MLE)	1.8953812
Theta hat (MLE)	237866.94	Theta star (bias corrected MLE)	257552.42
nu hat (MLE)	143.65679	nu star (bias corrected)	132.67668
MLE Mean (bias corrected)	488160.00	MLE Sd (bias corrected)	354579.73
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.6280211	nu hat (KM)	77.874617
Approximate Chi Square Value (77.87, α)	58.545147	Adjusted Chi Square Value (77.87, β)	58.146860
95% Gamma Approximate KM-UCL (use when n>=50)	367120.62	95% Gamma Adjusted KM-UCL (use when n<50)	369635.27
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	275574.20
Maximum	1390000.0	Median	158500.00
SD	351450.00	CV	1.2753371
k hat (MLE)	0.1100915	k star (bias corrected MLE)	0.1155171
Theta hat (MLE)	2503138.8	Theta star (bias corrected MLE)	2385569.8
nu hat (MLE)	13.651341	nu star (bias corrected)	14.324125
MLE Mean (bias corrected)	275574.20	MLE Sd (bias corrected)	810802.98
		Adjusted Level of Significance (β)	0.0461290
Approximate Chi Square Value (14.32, α)	6.7938462	Adjusted Chi Square Value (14.32, β)	6.6701061
95% Gamma Approximate UCL (use when n>=50)	581019.83	95% Gamma Adjusted UCL (use when n<50)	591798.59
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9470086	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9340000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1295324	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1497613	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	302405.72	Mean in Log Scale	12.035447
SD in Original Scale	330956.77	SD in Log Scale	1.1103619

UCL Statistics for Soil Data Sets with Non-Detects			
95% t UCL (assumes normality of ROS data)	372607.63	95% Percentile Bootstrap UCL	373321.53
95% BCA Bootstrap UCL	374717.13	95% Bootstrap t UCL	387260.06
95% H-UCL (Log ROS)	432167.73		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	10.240743	95% H-UCL (KM -Log)	12741986
KM SD (logged)	3.0138784	95% Critical H Value (KM-Log)	4.0891147
KM Standard Error of Mean (logged)	0.3883510		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	278247.66	Mean in Log Scale	10.993743
SD in Original Scale	349328.04	SD in Log Scale	2.2406868
95% t UCL (Assumes normality)	352346.45	95% H-Stat UCL	1888970.3

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Gamma Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	350949.59	95% GROS Approximate Gamma UCL	581019.83
95% Approximate Gamma KM-UCL	367120.62		

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CARBON DISULFIDE

General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	30.000000
		Number of Missing Observations	1.0000000
Number of Detects	27.000000	Number of Non-Detects	38.000000
Number of Distinct Detects	25.000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	2.0000000	Minimum Non-Detect	2.0000000
Maximum Detect	100.00000	Maximum Non-Detect	3.2000000
Variance Detects	1265.9633	Percent Non-Detects	58.461538%
Mean Detects	32.344444	SD Detects	35.580378
Median Detects	11.000000	CV Detects	1.1000461
Skewness Detects	0.7984658	Kurtosis Detects	-1.082924
Mean of Logged Detects	2.6823155	SD of Logged Detects	1.3704705

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.7691158	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9230000	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.3088599	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1705108	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

UCL Statistics for Soil Data Sets with Non-Detects			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	14.607107	Standard Error of Mean	3.4149082
SD	27.017178	95% KM (BCA) UCL	20.180271
95% KM (t) UCL	20.306633	95% KM (Percentile Bootstrap) UCL	20.340054
95% KM (z) UCL	20.224131	95% KM Bootstrap t UCL	21.462217
90% KM Chebyshev UCL	24.851832	95% KM Chebyshev UCL	29.492347
97.5% KM Chebyshev UCL	35.933202	99% KM Chebyshev UCL	48.585014
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	1.6345843	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7837862	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2222876	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1749434	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	0.7533693	k star (bias corrected MLE)	0.6943530
Theta hat (MLE)	42.933053	Theta star (bias corrected MLE)	46.582136
nu hat (MLE)	40.681942	nu star (bias corrected)	37.495060
MLE Mean (bias corrected)	32.344444	MLE Sd (bias corrected)	38.815890
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.2923132	nu hat (KM)	38.000720
Approximate Chi Square Value (38.00, α)	24.884572	Adjusted Chi Square Value (38.00, β)	24.643641
95% Gamma Approximate KM-UCL (use when n>=50)	22.306214	95% Gamma Adjusted KM-UCL (use when n<50)	22.524293
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	13.441231
Maximum	100.00000	Median	0.0100000
SD	27.787733	CV	2.0673504
k hat (MLE)	0.1792165	k star (bias corrected MLE)	0.1812014
Theta hat (MLE)	74.999969	Theta star (bias corrected MLE)	74.178419
nu hat (MLE)	23.298143	nu star (bias corrected)	23.556178
MLE Mean (bias corrected)	13.441231	MLE Sd (bias corrected)	31.576087
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (23.56, α)	13.511634	Adjusted Chi Square Value (23.56, β)	13.338683
95% Gamma Approximate UCL (use when n>=50)	23.433437	95% Gamma Adjusted UCL (use when n<50)	23.737277
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8806381	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9230000	Detected Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1816299	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1705108	Detected Data Not Lognormal at 5% Significance Level	
Detected Data Not Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			

UCL Statistics for Soil Data Sets with Non-Detects			
Mean in Original Scale	13.761754	Mean in Log Scale	0.4445427
SD in Original Scale	27.634094	SD in Log Scale	2.3013366
95% t UCL (assumes normality of ROS data)	19.482443	95% Percentile Bootstrap UCL	19.599114
95% BCA Bootstrap UCL	20.301822	95% Bootstrap t UCL	21.321925
95% H-UCL (Log ROS)	55.484166		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	14.076923	Mean in Log Scale	1.1621599
SD in Original Scale	27.479528	SD in Log Scale	1.5628981
95% t UCL (Assumes normality)	19.765614	95% H-Stat UCL	17.693454

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (BCA) UCL	20.180271

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CHROMIUM

General Statistics			
Total Number of Observations	62.000000	Number of Distinct Observations	52.000000
		Number of Missing Observations	4.0000000
Minimum	484.00000	Mean	4037.4839
Maximum	8030.0000	Median	3685.0000
SD	1645.1087	Std. Error of Mean	208.92902
Coefficient of Variation	0.4074589	Skewness	0.6610595

Normal GOF Test		
Shapiro Wilk Test Statistic	0.9425083	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.0102689	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1131346	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1125221	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	4386.4412	95% Adjusted-CLT UCL (Chen-1995)	4399.8839
		95% Modified-t UCL (Johnson-1978)	4389.3646

Gamma GOF Test		
A-D Test Statistic	0.4213643	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7531706	Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Soil Data Sets with Non-Detects			
K-S Test Statistic	0.0769187	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1133062	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	5.6983959	k star (bias corrected MLE)	5.4334198
Theta hat (MLE)	708.52990	Theta star (bias corrected MLE)	743.08337
nu hat (MLE)	706.60109	nu star (bias corrected)	673.74405
MLE Mean (bias corrected)	4037.4839	MLE Sd (bias corrected)	1732.1048
		Approximate Chi Square Value (0.05)	614.52274
Adjusted Level of Significance	0.0461290	Adjusted Chi Square Value	613.18607
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	4426.5745	95% Adjusted Gamma UCL (use when n<50)	4436.2240
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9245434	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	8.6004E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0866310	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1125221	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	6.1820849	Mean of logged Data	8.2130744
Maximum of Logged Data	8.9909398	SD of logged Data	0.4592735
Assuming Lognormal Distribution			
95% H-UCL	4566.7228	90% Chebyshev (MVUE) UCL	4839.2274
95% Chebyshev (MVUE) UCL	5177.9184	97.5% Chebyshev (MVUE) UCL	5648.0083
99% Chebyshev (MVUE) UCL	6571.4090		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	4381.1415	95% Jackknife UCL	4386.4412
95% Standard Bootstrap UCL	4385.5847	95% Bootstrap-t UCL	4422.9057
95% Hall's Bootstrap UCL	4406.9753	95% Percentile Bootstrap UCL	4382.3226
95% BCA Bootstrap UCL	4406.5161		
90% Chebyshev(Mean, Sd) UCL	4664.2709	95% Chebyshev(Mean, Sd) UCL	4948.1843
97.5% Chebyshev(Mean, Sd) UCL	5342.2452	99% Chebyshev(Mean, Sd) UCL	6116.3013
Suggested UCL to Use			
95% Approximate Gamma UCL	4426.5745		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			

UCL Statistics for Soil Data Sets with Non-Detects

CHRYSENE

General Statistics

Total Number of Observations	66.000000	Number of Distinct Observations	24.000000
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	180.00000	Minimum Non-Detect	36.000000
Maximum Detect	2500.0000	Maximum Non-Detect	91.000000
Variance Detects	1548400.0	Percent Non-Detects	95.454545%
Mean Detects	1080.0000	SD Detects	1244.3472
Median Detects	560.00000	CV Detects	1.1521734
Skewness Detects	1.5521081	Kurtosis Detects	N/A
Mean of Logged Detects	6.4483132	SD of Logged Detects	1.3196687

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8690094	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3286528	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	83.454545	Standard Error of Mean	46.272863
SD	306.93945	95% KM (BCA) UCL	N/A
95% KM (t) UCL	160.66711	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	159.56663	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	222.27313	95% KM Chebyshev UCL	285.15328
97.5% KM Chebyshev UCL	372.42848	99% KM Chebyshev UCL	543.86371

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.0679706	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1011.2638	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.4078236	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0739256	nu hat (KM)	9.7581730
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (9.76, α)	3.7911871	Adjusted Chi Square Value (9.76, β)	3.7082667
95% Gamma Approximate KM-UCL (use when n>=50)	214.80446	95% Gamma Adjusted KM-UCL (use when n<50)	219.60769

Gamma (KM) may not be used when k hat (KM) is < 0.1

Lognormal GOF Test on Detected Observations Only

UCL Statistics for Soil Data Sets with Non-Detects			
Shapiro Wilk Test Statistic	0.9937405	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2030066	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	49.282045	Mean in Log Scale	-5.113944
SD in Original Scale	314.66084	SD in Log Scale	4.2263360
95% t UCL (assumes normality of ROS data)	113.91177	95% Percentile Bootstrap UCL	122.39969
95% BCA Bootstrap UCL	198.02767	95% Bootstrap t UCL	12074.462
95% H-UCL (Log ROS)	841.57432		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.7137369	95% H-UCL (KM -Log)	58.793002
KM SD (logged)	0.6394250	95% Critical H Value (KM-Log)	1.9650991
KM Standard Error of Mean (logged)	0.0963969		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	73.704545	Mean in Log Scale	3.3473764
SD in Original Scale	310.93108	SD in Log Scale	0.7807041
95% t UCL (Assumes normality)	137.56820	95% H-Stat UCL	47.161086
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			

Suggested UCL to Use			
95% KM (t) UCL	160.66711	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

COBALT

General Statistics			
Total Number of Observations	61.000000	Number of Distinct Observations	46.000000
		Number of Missing Observations	5.0000000
Number of Detects	52.000000	Number of Non-Detects	9.0000000
Number of Distinct Detects	40.000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	129.00000	Minimum Non-Detect	10.000000
Maximum Detect	620.00000	Maximum Non-Detect	138.00000
Variance Detects	16009.998	Percent Non-Detects	14.754098%
Mean Detects	299.03846	SD Detects	126.53062
Median Detects	273.00000	CV Detects	0.4231249
Skewness Detects	0.8087582	Kurtosis Detects	0.0079837

UCL Statistics for Soil Data Sets with Non-Detects			
Mean of Logged Detects	5.6150028	SD of Logged Detects	0.4193901
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9228671	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0.0024575	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1559551	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1228661	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	260.67131	Standard Error of Mean	19.499400
SD	149.26421	95% KM (BCA) UCL	301.21311
95% KM (t) UCL	293.24796	95% KM (Percentile Bootstrap) UCL	297.68384
95% KM (z) UCL	292.74497	95% KM Bootstrap t UCL	292.53813
90% KM Chebyshev UCL	319.16951	95% KM Chebyshev UCL	345.66723
97.5% KM Chebyshev UCL	382.44503	99% KM Chebyshev UCL	454.68789
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.3407339	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7528579	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1050108	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1233888	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	6.0049451	k star (bias corrected MLE)	5.6713265
Theta hat (MLE)	49.798700	Theta star (bias corrected MLE)	52.728134
nu hat (MLE)	624.51429	nu star (bias corrected)	589.81796
MLE Mean (bias corrected)	299.03846	MLE Sd (bias corrected)	125.56966
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	3.0498262	nu hat (KM)	372.07880
Approximate Chi Square Value (372.08, α)	328.37388	Adjusted Chi Square Value (372.08, β)	327.38607
95% Gamma Approximate KM-UCL (use when n>=50)	295.36536	95% Gamma Adjusted KM-UCL (use when n<50)	296.25655
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	52.092459	Mean	267.19730
Maximum	620.00000	Median	260.00000
SD	140.01226	CV	0.5240033
k hat (MLE)	3.4423675	k star (bias corrected MLE)	3.2839997
Theta hat (MLE)	77.620213	Theta star (bias corrected MLE)	81.363375
nu hat (MLE)	419.96883	nu star (bias corrected)	400.64796
MLE Mean (bias corrected)	267.19730	MLE Sd (bias corrected)	147.44516
		Adjusted Level of Significance (β)	0.0460656
Approximate Chi Square Value (400.65, α)	355.25125	Adjusted Chi Square Value (400.65, β)	354.22294
95% Gamma Approximate UCL (use when n>=50)	301.34181	95% Gamma Adjusted UCL (use when n<50)	302.21660

UCL Statistics for Soil Data Sets with Non-Detects			
Lognormal GOF Test on Detected Observations Only			
Lilliefors Test Statistic	0.0773388	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1228661	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	271.51719	Mean in Log Scale	5.4827182
SD in Original Scale	134.44085	SD in Log Scale	0.5036921
95% t UCL (assumes normality of ROS data)	300.27471	95% Percentile Bootstrap UCL	300.00683
95% BCA Bootstrap UCL	303.05657	95% Bootstrap t UCL	300.49354
95% H-UCL (Log ROS)	308.19663		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	5.2177321	95% H-UCL (KM -Log)	475.82035
KM SD (logged)	1.1121086	95% Critical H Value (KM-Log)	2.2909349
KM Standard Error of Mean (logged)	0.1557370		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	263.57377	Mean in Log Scale	5.3610483
SD in Original Scale	145.09149	SD in Log Scale	0.7914583
95% t UCL (Assumes normality)	294.60951	95% H-Stat UCL	360.26659
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (BCA) UCL	301.21311	95% GROS Approximate Gamma UCL	301.34181
95% Approximate Gamma KM-UCL	295.36536		
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
COPPER			
General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	58.000000
		Number of Missing Observations	0
Minimum	320.00000	Mean	2298.9394
Maximum	4850.0000	Median	2255.0000
SD	973.67366	Std. Error of Mean	119.85094
Coefficient of Variation	0.4235317	Skewness	0.2227308
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9814325	**Shapiro Wilk GOF Test**	

UCL Statistics for Soil Data Sets with Non-Detects			
5% Shapiro Wilk P Value	0.7106634	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0671291	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1090591	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2498.9270	95% Adjusted-CLT UCL (Chen-1995)	2499.5876
		95% Modified-t UCL (Johnson-1978)	2499.4746
Gamma GOF Test			
A-D Test Statistic	0.7449734	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7542332	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1032969	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1100719	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	4.6008022	k star (bias corrected MLE)	4.4017759
Theta hat (MLE)	499.68229	Theta star (bias corrected MLE)	522.27543
nu hat (MLE)	607.30589	nu star (bias corrected)	581.03441
MLE Mean (bias corrected)	2298.9394	MLE Sd (bias corrected)	1095.7553
		Approximate Chi Square Value (0.05)	526.12262
Adjusted Level of Significance	0.0463636	Adjusted Chi Square Value	524.96454
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	2538.8813	95% Adjusted Gamma UCL (use when n<50)	2544.4821
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9191612	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	2.2990E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1389066	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1090591	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	5.7683210	Mean of logged Data	7.6276078
Maximum of Logged Data	8.4867340	SD of logged Data	0.5244052
Assuming Lognormal Distribution			
95% H-UCL	2663.8493	90% Chebyshev (MVUE) UCL	2833.0042
95% Chebyshev (MVUE) UCL	3051.1691	97.5% Chebyshev (MVUE) UCL	3353.9736
99% Chebyshev (MVUE) UCL	3948.7744		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	2496.0767	95% Jackknife UCL	2498.9270
95% Standard Bootstrap UCL	2492.7567	95% Bootstrap-t UCL	2506.3513

UCL Statistics for Soil Data Sets with Non-Detects			
95% Hall's Bootstrap UCL	2502.4195	95% Percentile Bootstrap UCL	2492.4242
95% BCA Bootstrap UCL	2492.4242		
90% Chebyshev(Mean, Sd) UCL	2658.4922	95% Chebyshev(Mean, Sd) UCL	2821.3575
97.5% Chebyshev(Mean, Sd) UCL	3047.4083	99% Chebyshev(Mean, Sd) UCL	3491.4412

Suggested UCL to Use	
95% Student's-t UCL	2498.9270

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

ENDOSULFAN SULFATE

General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	32.000000
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	29.000000
Minimum Detect	2.4200000	Minimum Non-Detect	0.2240000
Maximum Detect	13.600000	Maximum Non-Detect	6.8000000
Variance Detects	35.425300	Percent Non-Detects	95.454545%
Mean Detects	6.8300000	SD Detects	5.9519157
Median Detects	4.4700000	CV Detects	0.8714371
Skewness Detects	1.5037702	Kurtosis Detects	N/A
Mean of Logged Detects	1.6637419	SD of Logged Detects	0.8750914

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8820674	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3208026	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	0.5257978	Standard Error of Mean	0.2601032
SD	1.7237817	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.9598154	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.9536295	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.3061074	95% KM Chebyshev UCL	1.6595614
97.5% KM Chebyshev UCL	2.1501418	99% KM Chebyshev UCL	3.1137921

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

UCL Statistics for Soil Data Sets with Non-Detects			
k hat (MLE)	2.0925176	k star (bias corrected MLE)	N/A
Theta hat (MLE)	3.2640108	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	12.555105	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.0930407	nu hat (KM)	12.281374
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (12.28, α)	5.4129153	Adjusted Chi Square Value (12.28, β)	5.3109648
95% Gamma Approximate KM-UCL (use when n>=50)	1.1929837	95% Gamma Adjusted KM-UCL (use when n<50)	1.2158845

Gamma (KM) may not be used when k hat (KM) is < 0.1

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9728783	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2420507	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.3483435	Mean in Log Scale	-3.732193
SD in Original Scale	1.7674857	SD in Log Scale	1.7541731
95% t UCL (assumes normality of ROS data)	0.7113761	95% Percentile Bootstrap UCL	0.7603300
95% BCA Bootstrap UCL	1.0327346	95% Bootstrap t UCL	2.0215921
95% H-UCL (Log ROS)	0.2007607		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-1.351208	95% H-UCL (KM -Log)	0.3853154
KM SD (logged)	0.6778787	95% Critical H Value (KM-Log)	1.9951669
KM Standard Error of Mean (logged)	0.1025723		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.5571667	Mean in Log Scale	-1.515136
SD in Original Scale	1.7775737	SD in Log Scale	0.9458701
95% t UCL (Assumes normality)	0.9222712	95% H-Stat UCL	0.4461055

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	0.9598154	95% KM (Percentile Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Soil Data Sets with Non-Detects

FLUORANTHENE

General Statistics

Total Number of Observations	65.000000	Number of Distinct Observations	26.000000
		Number of Missing Observations	1.0000000
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	23.000000
Minimum Detect	84.000000	Minimum Non-Detect	44.000000
Maximum Detect	920.00000	Maximum Non-Detect	98.000000
Variance Detects	194245.33	Percent Non-Detects	95.384615%
Mean Detects	421.33333	SD Detects	440.73272
Median Detects	260.00000	CV Detects	1.0460429
Skewness Detects	1.4265281	Kurtosis Detects	N/A
Mean of Logged Detects	5.6052907	SD of Logged Detects	1.1974018

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8994844	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3095054	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	61.480162	Standard Error of Mean	16.812106
SD	110.65812	95% KM (BCA) UCL	N/A
95% KM (t) UCL	89.539786	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	89.133616	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	111.91648	95% KM Chebyshev UCL	134.76243
97.5% KM Chebyshev UCL	166.47173	99% KM Chebyshev UCL	228.75851

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.2822439	k star (bias corrected MLE)	N/A
Theta hat (MLE)	328.59063	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.6934635	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.3086764	nu hat (KM)	40.127932
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (40.13, α)	26.613675	Adjusted Chi Square Value (40.13, β)	26.363900
95% Gamma Approximate KM-UCL (use when n>=50)	92.699404	95% Gamma Adjusted KM-UCL (use when n<50)	93.577647

Lognormal GOF Test on Detected Observations Only

UCL Statistics for Soil Data Sets with Non-Detects			
Shapiro Wilk Test Statistic	0.9989399	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1815258	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	19.758772	Mean in Log Scale	-3.028424
SD in Original Scale	118.30404	SD in Log Scale	3.0763637
95% t UCL (assumes normality of ROS data)	44.249553	95% Percentile Bootstrap UCL	46.740990
95% BCA Bootstrap UCL	68.889773	95% Bootstrap t UCL	227.19128
95% H-UCL (Log ROS)	25.501837		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.8692876	95% H-UCL (KM -Log)	58.221152
KM SD (logged)	0.4365965	95% Critical H Value (KM-Log)	1.8259942
KM Standard Error of Mean (logged)	0.0664516		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	47.992308	Mean in Log Scale	3.4711940
SD in Original Scale	113.92859	SD in Log Scale	0.5700773
95% t UCL (Assumes normality)	71.577301	95% H-Stat UCL	43.378881
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			

Suggested UCL to Use			
95% KM (t) UCL	89.539786	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

IRON

General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	60.000000
		Number of Missing Observations	3.0000000
Minimum	98300.000	Mean	2103671.4
Maximum	5820000.0	Median	1960000.0
SD	1245370.6	Std. Error of Mean	156901.94
Coefficient of Variation	0.5919986	Skewness	0.6331802

Normal GOF Test			
Shapiro Wilk Test Statistic	0.9602728	**Shapiro Wilk GOF Test**	

UCL Statistics for Soil Data Sets with Non-Detects			
5% Shapiro Wilk P Value	0.0964365	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0818370	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2365666.9	95% Adjusted-CLT UCL (Chen-1995)	2375126.3
		95% Modified-t UCL (Johnson-1978)	2367753.0
Gamma GOF Test			
A-D Test Statistic	0.4611492	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7617531	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0678737	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1134764	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.2475121	k star (bias corrected MLE)	2.1510698
Theta hat (MLE)	936000.03	Theta star (bias corrected MLE)	977965.22
nu hat (MLE)	283.18653	nu star (bias corrected)	271.03479
MLE Mean (bias corrected)	2103671.4	MLE Sd (bias corrected)	1434335.2
		Approximate Chi Square Value (0.05)	233.90894
Adjusted Level of Significance	0.0461905	Adjusted Chi Square Value	233.10577
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	2437564.6	95% Adjusted Gamma UCL (use when n<50)	2445963.2
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9035504	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	3.7269E-5	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1144175	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	11.495779	Mean of logged Data	14.320530
Maximum of Logged Data	15.576811	SD of logged Data	0.8088804
Assuming Lognormal Distribution			
95% H-UCL	2851443.2	90% Chebyshev (MVUE) UCL	3069988.5
95% Chebyshev (MVUE) UCL	3426590.9	97.5% Chebyshev (MVUE) UCL	3921541.1
99% Chebyshev (MVUE) UCL	4893775.1		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	2361752.2	95% Jackknife UCL	2365666.9
95% Standard Bootstrap UCL	2357429.3	95% Bootstrap-t UCL	2376103.1

UCL Statistics for Soil Data Sets with Non-Detects			
95% Hall's Bootstrap UCL	2383743.1	95% Percentile Bootstrap UCL	2348401.6
95% BCA Bootstrap UCL	2381342.9		
90% Chebyshev(Mean, Sd) UCL	2574377.3	95% Chebyshev(Mean, Sd) UCL	2787591.1
97.5% Chebyshev(Mean, Sd) UCL	3083523.8	99% Chebyshev(Mean, Sd) UCL	3664826.1

Suggested UCL to Use	
95% Student's-t UCL	2365666.9

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

LEAD

General Statistics			
Total Number of Observations	62.000000	Number of Distinct Observations	56.000000
		Number of Missing Observations	4.0000000
Minimum	978.00000	Mean	4189.9677
Maximum	9600.0000	Median	3985.0000
SD	1973.0514	Std. Error of Mean	250.57778
Coefficient of Variation	0.4708990	Skewness	0.7894297

Normal GOF Test		
Shapiro Wilk Test Statistic	0.9330644	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0.0028199	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1596217	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1125221	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	4608.4876	95% Adjusted-CLT UCL (Chen-1995)	4628.9751
		95% Modified-t UCL (Johnson-1978)	4612.6747

Gamma GOF Test		
A-D Test Statistic	0.6825798	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7537965	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1023714	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.1134143	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	4.3772754	k star (bias corrected MLE)	4.1762245
Theta hat (MLE)	957.20907	Theta star (bias corrected MLE)	1003.2908
nu hat (MLE)	542.78215	nu star (bias corrected)	517.85183
MLE Mean (bias corrected)	4189.9677	MLE Sd (bias corrected)	2050.3064
		Approximate Chi Square Value (0.05)	466.07775
Adjusted Level of Significance	0.0461290	Adjusted Chi Square Value	464.91643

UCL Statistics for Soil Data Sets with Non-Detects			
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	4655.4088	95% Adjusted Gamma UCL (use when n<50)	4667.0377
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9423910	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0101076	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1269719	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1125221	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	6.8855097	Mean of logged Data	8.2218950
Maximum of Logged Data	9.1695184	SD of logged Data	0.5165904
Assuming Lognormal Distribution			
95% H-UCL	4813.5646	90% Chebyshev (MVUE) UCL	5123.9115
95% Chebyshev (MVUE) UCL	5523.1699	97.5% Chebyshev (MVUE) UCL	6077.3250
99% Chebyshev (MVUE) UCL	7165.8553		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	4602.1315	95% Jackknife UCL	4608.4876
95% Standard Bootstrap UCL	4592.4718	95% Bootstrap-t UCL	4648.9612
95% Hall's Bootstrap UCL	4631.8391	95% Percentile Bootstrap UCL	4581.2903
95% BCA Bootstrap UCL	4636.3871		
90% Chebyshev(Mean, Sd) UCL	4941.7011	95% Chebyshev(Mean, Sd) UCL	5282.2110
97.5% Chebyshev(Mean, Sd) UCL	5754.8255	99% Chebyshev(Mean, Sd) UCL	6683.1852
Suggested UCL to Use			
95% Approximate Gamma UCL	4655.4088		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			

MAGNESIUM

General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	58.000000
		Number of Missing Observations	3.0000000
Minimum	6460.0000	Mean	138293.02
Maximum	357000.00	Median	136000.00
SD	77849.031	Std. Error of Mean	9808.0560
Coefficient of Variation	0.5629281	Skewness	1.0552742

UCL Statistics for Soil Data Sets with Non-Detects			
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9070495	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk P Value	6.1623E-5	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1011682	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	154670.55	95% Adjusted-CLT UCL (Chen-1995)	155819.18
		95% Modified-t UCL (Johnson-1978)	154887.88
Gamma GOF Test			
A-D Test Statistic	0.4720732	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7577212	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0729509	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1130300	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.0382411	k star (bias corrected MLE)	2.9041450
Theta hat (MLE)	45517.459	Theta star (bias corrected MLE)	47619.184
nu hat (MLE)	382.81838	nu star (bias corrected)	365.92227
MLE Mean (bias corrected)	138293.02	MLE Sd (bias corrected)	81150.481
		Approximate Chi Square Value (0.05)	322.59036
Adjusted Level of Significance	0.0461905	Adjusted Chi Square Value	321.64353
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	156869.21	95% Adjusted Gamma UCL (use when n<50)	157330.99
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9216999	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	5.0517E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1043502	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	8.7733846	Mean of logged Data	11.663627
Maximum of Logged Data	12.785491	SD of logged Data	0.6557876
Assuming Lognormal Distribution			
95% H-UCL	169906.88	90% Chebyshev (MVUE) UCL	182258.32
95% Chebyshev (MVUE) UCL	199784.74	97.5% Chebyshev (MVUE) UCL	224110.74
99% Chebyshev (MVUE) UCL	271894.45		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			

UCL Statistics for Soil Data Sets with Non-Detects			
95% CLT UCL	154425.83	95% Jackknife UCL	154670.55
95% Standard Bootstrap UCL	154038.47	95% Bootstrap-t UCL	157168.93
95% Hall's Bootstrap UCL	155893.50	95% Percentile Bootstrap UCL	153904.76
95% BCA Bootstrap UCL	156243.81		
90% Chebyshev(Mean, Sd) UCL	167717.18	95% Chebyshev(Mean, Sd) UCL	181045.34
97.5% Chebyshev(Mean, Sd) UCL	199544.31	99% Chebyshev(Mean, Sd) UCL	235881.94

Suggested UCL to Use	
95% Student's-t UCL	154670.55

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

MANGANESE

General Statistics			
Total Number of Observations	61.000000	Number of Distinct Observations	56.000000
		Number of Missing Observations	5.0000000
Minimum	1900.0000	Mean	11609.672
Maximum	35700.000	Median	9400.0000
SD	8115.8618	Std. Error of Mean	1039.1296
Coefficient of Variation	0.6990604	Skewness	1.0927685

Normal GOF Test		
Shapiro Wilk Test Statistic	0.8889127	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	7.1999E-6	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1319888	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1134407	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	13345.693	95% Adjusted-CLT UCL (Chen-1995)	13474.239
		95% Modified-t UCL (Johnson-1978)	13369.924

Gamma GOF Test		
A-D Test Statistic	0.4119546	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7620798	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0874700	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.1151926	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics			
k hat (MLE)	2.1717261	k star (bias corrected MLE)	2.0758489
Theta hat (MLE)	5345.8269	Theta star (bias corrected MLE)	5592.7347
nu hat (MLE)	264.95059	nu star (bias corrected)	253.25357
MLE Mean (bias corrected)	11609.672	MLE Sd (bias corrected)	8057.9039

UCL Statistics for Soil Data Sets with Non-Detects			
		Approximate Chi Square Value (0.05)	217.40636
Adjusted Level of Significance	0.0460656	Adjusted Chi Square Value	216.60660
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	13523.941	95% Adjusted Gamma UCL (use when n<50)	13573.875
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9675311	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.2324896	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0907612	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1134407	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	7.5496092	Mean of logged Data	9.1120364
Maximum of Logged Data	10.482906	SD of logged Data	0.7339430
Assuming Lognormal Distribution			
95% H-UCL	14385.048	90% Chebyshev (MVUE) UCL	15481.733
95% Chebyshev (MVUE) UCL	17149.526	97.5% Chebyshev (MVUE) UCL	19464.359
99% Chebyshev (MVUE) UCL	24011.399		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	13318.888	95% Jackknife UCL	13345.693
95% Standard Bootstrap UCL	13279.328	95% Bootstrap-t UCL	13542.545
95% Hall's Bootstrap UCL	13434.227	95% Percentile Bootstrap UCL	13320.492
95% BCA Bootstrap UCL	13711.639		
90% Chebyshev(Mean, Sd) UCL	14727.061	95% Chebyshev(Mean, Sd) UCL	16139.133
97.5% Chebyshev(Mean, Sd) UCL	18099.035	99% Chebyshev(Mean, Sd) UCL	21948.881
Suggested UCL to Use			
95% Approximate Gamma UCL	13523.941		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

MERCURY

General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	37.000000
		Number of Missing Observations	1.0000000
Number of Detects	37.000000	Number of Non-Detects	28.000000
Number of Distinct Detects	27.000000	Number of Distinct Non-Detects	10.000000
Minimum Detect	40.000000	Minimum Non-Detect	8.2000000

UCL Statistics for Soil Data Sets with Non-Detects			
Maximum Detect	540.00000	Maximum Non-Detect	10.000000
Variance Detects	14250.533	Percent Non-Detects	43.076923%
Mean Detects	194.45946	SD Detects	119.37560
Median Detects	180.00000	CV Detects	0.6138842
Skewness Detects	0.7649107	Kurtosis Detects	0.4078731
Mean of Logged Detects	5.0533753	SD of Logged Detects	0.7168046

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9398500	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9360000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1046744	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1456575	Detected Data appear Normal at 5% Significance Level
Detected Data appear Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	114.22462	Standard Error of Mean	16.103039
SD	128.06042	95% KM (BCA) UCL	142.25538
95% KM (t) UCL	141.10080	95% KM (Percentile Bootstrap) UCL	140.80000
95% KM (z) UCL	140.71176	95% KM Bootstrap t UCL	143.45673
90% KM Chebyshev UCL	162.53373	95% KM Chebyshev UCL	184.41614
97.5% KM Chebyshev UCL	214.78806	99% KM Chebyshev UCL	274.44784

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.3193759	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7569676	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0914105	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.1464618	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.4595932	k star (bias corrected MLE)	2.2781847
Theta hat (MLE)	79.061636	Theta star (bias corrected MLE)	85.357196
nu hat (MLE)	182.00990	nu star (bias corrected)	168.58567
MLE Mean (bias corrected)	194.45946	MLE Sd (bias corrected)	128.83522

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.7955904	nu hat (KM)	103.42676
Approximate Chi Square Value (103.43, α)	80.960147	Adjusted Chi Square Value (103.43, β)	80.510674
95% Gamma Approximate KM-UCL (use when n>=50)	145.92219	95% Gamma Adjusted KM-UCL (use when n<50)	146.73684

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	113.28173
Maximum	540.00000	Median	59.000000
SD	130.08573	CV	1.1483381
k hat (MLE)	0.2438174	k star (bias corrected MLE)	0.2428207
Theta hat (MLE)	464.61701	Theta star (bias corrected MLE)	466.52412

UCL Statistics for Soil Data Sets with Non-Detects			
nu hat (MLE)	31.696268	nu star (bias corrected)	31.566696
MLE Mean (bias corrected)	113.28173	MLE Sd (bias corrected)	229.88837
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (31.57, α)	19.728734	Adjusted Chi Square Value (31.57, β)	19.516152
95% Gamma Approximate UCL (use when n>=50)	181.25491	95% Gamma Adjusted UCL (use when n<50)	183.22926

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9367843	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9360000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1149246	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1456575	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	123.99272	Mean in Log Scale	4.3171659
SD in Original Scale	121.40698	SD in Log Scale	1.0498966
95% t UCL (assumes normality of ROS data)	149.12586	95% Percentile Bootstrap UCL	149.55908
95% BCA Bootstrap UCL	152.34457	95% Bootstrap t UCL	151.89682
95% H-UCL (Log ROS)	175.14062		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.7829329	95% H-UCL (KM -Log)	239.13950
KM SD (logged)	1.5547952	95% Critical H Value (KM-Log)	2.4976672
KM Standard Error of Mean (logged)	0.1955087		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	112.74692	Mean in Log Scale	3.5485637
SD in Original Scale	130.29553	SD in Log Scale	1.8248464
95% t UCL (Assumes normality)	139.72013	95% H-Stat UCL	349.06764
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	141.10080	95% KM (Percentile Bootstrap) UCL	140.80000

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

NICKEL

General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	55.000000
		Number of Missing Observations	1.0000000
Number of Detects	61.000000	Number of Non-Detects	4.0000000
Number of Distinct Detects	51.000000	Number of Distinct Non-Detects	4.0000000

UCL Statistics for Soil Data Sets with Non-Detects			
Minimum Detect	314.00000	Minimum Non-Detect	323.00000
Maximum Detect	3300.0000	Maximum Non-Detect	346.00000
Variance Detects	443331.11	Percent Non-Detects	6.1538462%
Mean Detects	1201.4098	SD Detects	665.83114
Median Detects	1110.0000	CV Detects	0.5542082
Skewness Detects	1.3124674	Kurtosis Detects	2.0116738
Mean of Logged Detects	6.9475927	SD of Logged Detects	0.5493358

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8856061	**Normal GOF Test on Detected Observations Only**
5% Shapiro Wilk P Value	4.5816E-6	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1430435	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1134407	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	1146.8000	Standard Error of Mean	84.333245
SD	674.32024	95% KM (BCA) UCL	1297.1231
95% KM (t) UCL	1287.5533	95% KM (Percentile Bootstrap) UCL	1290.4769
95% KM (z) UCL	1285.5158	95% KM Bootstrap t UCL	1311.8228
90% KM Chebyshev UCL	1399.7997	95% KM Chebyshev UCL	1514.4001
97.5% KM Chebyshev UCL	1673.4609	99% KM Chebyshev UCL	1985.9052

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.4862009	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7552824	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0775268	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.1144443	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	3.6387342	k star (bias corrected MLE)	3.4707090
Theta hat (MLE)	330.17247	Theta star (bias corrected MLE)	346.15689
nu hat (MLE)	443.92557	nu star (bias corrected)	423.42650
MLE Mean (bias corrected)	1201.4098	MLE Sd (bias corrected)	644.88472

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	2.8922976	nu hat (KM)	375.99868
Approximate Chi Square Value (376.00, α)	332.05788	Adjusted Chi Square Value (376.00, β)	331.12743
95% Gamma Approximate KM-UCL (use when n>=50)	1298.5546	95% Gamma Adjusted KM-UCL (use when n<50)	1302.2035

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	168.74791	Mean	1137.8614
Maximum	3300.0000	Median	1100.0000
SD	691.49897	CV	0.6077181
k hat (MLE)	2.6390849	k star (bias corrected MLE)	2.5275373

UCL Statistics for Soil Data Sets with Non-Detects			
Theta hat (MLE)	431.15757	Theta star (bias corrected MLE)	450.18579
nu hat (MLE)	343.08103	nu star (bias corrected)	328.57986
MLE Mean (bias corrected)	1137.8614	MLE Sd (bias corrected)	715.71576
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (328.58, α)	287.58108	Adjusted Chi Square Value (328.58, β)	286.71658
95% Gamma Approximate UCL (use when n>=50)	1300.0797	95% Gamma Adjusted UCL (use when n<50)	1303.9997

Lognormal GOF Test on Detected Observations Only		
Lilliefors Test Statistic	0.1122216	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1134407	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1147.1062	Mean in Log Scale	6.8748249
SD in Original Scale	679.18777	SD in Log Scale	0.6040876
95% t UCL (assumes normality of ROS data)	1287.7087	95% Percentile Bootstrap UCL	1286.7681
95% BCA Bootstrap UCL	1298.6601	95% Bootstrap t UCL	1316.4139
95% H-UCL (Log ROS)	1344.2151		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	6.8738573	95% H-UCL (KM -Log)	1339.4578
KM SD (logged)	0.6012233	95% Critical H Value (KM-Log)	1.9350961
KM Standard Error of Mean (logged)	0.0751914		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1137.8000	Mean in Log Scale	6.8352565
SD in Original Scale	691.58729	SD in Log Scale	0.6916686
95% t UCL (Assumes normality)	1280.9693	95% H-Stat UCL	1404.9816
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			

Suggested UCL to Use			
95% KM (BCA) UCL	1297.1231	95% GROS Approximate Gamma UCL	1300.0797
95% Approximate Gamma KM-UCL	1298.5546		

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

PHENANTHRENE

General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	23.000000
		Number of Missing Observations	1.0000000
Number of Detects	2.0000000	Number of Non-Detects	63.000000

UCL Statistics for Soil Data Sets with Non-Detects			
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	92.000000	Minimum Non-Detect	40.000000
Maximum Detect	390.00000	Maximum Non-Detect	80.000000
Variance Detects	44402.000	Percent Non-Detects	96.923077%
Mean Detects	241.00000	SD Detects	210.71782
Median Detects	241.00000	CV Detects	0.8743478
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	5.2439677	SD of Logged Detects	1.0213155

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	46.184615	Standard Error of Mean	7.6217622
SD	43.450730	95% KM (BCA) UCL	N/A
95% KM (t) UCL	58.905436	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	58.721299	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	69.049902	95% KM Chebyshev UCL	79.407107
97.5% KM Chebyshev UCL	93.782505	99% KM Chebyshev UCL	122.02019

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.2285546	k star (bias corrected MLE)	N/A
Theta hat (MLE)	108.14184	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8.9142185	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	1.1297972	nu hat (KM)	146.87364
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (146.87, α)	119.86434	Adjusted Chi Square Value (146.87, β)	119.31324
95% Gamma Approximate KM-UCL (use when n>=50)	56.591497	95% Gamma Adjusted KM-UCL (use when n<50)	56.852893

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	7.4739340	Mean in Log Scale	-6.156160
SD in Original Scale	49.519043	SD in Log Scale	3.7687197
95% t UCL (assumes normality of ROS data)	17.725148	95% Percentile Bootstrap UCL	19.493300
95% BCA Bootstrap UCL	30.021837	95% Bootstrap t UCL	1800.0897
95% H-UCL (Log ROS)	26.719870		

DL/2 Statistics

UCL Statistics for Soil Data Sets with Non-Detects			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	32.653846	Mean in Log Scale	3.3016897
SD in Original Scale	46.064402	SD in Log Scale	0.4180827
95% t UCL (Assumes normality)	42.189895	95% H-Stat UCL	32.588366
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
95% KM (BCA) UCL	N/A		
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
POTASSIUM			
General Statistics			
Total Number of Observations	60.000000	Number of Distinct Observations	58.000000
		Number of Missing Observations	6.0000000
Number of Detects	57.000000	Number of Non-Detects	3.0000000
Number of Distinct Detects	55.000000	Number of Distinct Non-Detects	3.0000000
Minimum Detect	19500.000	Minimum Non-Detect	1580.0000
Maximum Detect	149000.00	Maximum Non-Detect	13400.000
Variance Detects	8.6191E+8	Percent Non-Detects	5.0000000%
Mean Detects	68710.526	SD Detects	29358.247
Median Detects	65000.000	CV Detects	0.4272744
Skewness Detects	0.4694424	Kurtosis Detects	-0.471565
Mean of Logged Detects	11.041931	SD of Logged Detects	0.4531473
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9478471	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0.0291246	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1045652	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1173536	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Approximate Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	65354.000	Standard Error of Mean	4156.7073
SD	31914.030	95% KM (BCA) UCL	71666.667
95% KM (t) UCL	72300.244	95% KM (Percentile Bootstrap) UCL	71930.000
95% KM (z) UCL	72191.175	95% KM Bootstrap t UCL	72078.091
90% KM Chebyshev UCL	77824.122	95% KM Chebyshev UCL	83472.667
97.5% KM Chebyshev UCL	91312.629	99% KM Chebyshev UCL	106712.72
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.7533802	**Anderson-Darling GOF Test**	

UCL Statistics for Soil Data Sets with Non-Detects			
5% A-D Critical Value	0.7532282	Detected Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1187314	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1181589	Detected Data Not Gamma Distributed at 5% Significance Level	
Detected Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	5.3843561	k star (bias corrected MLE)	5.1126648
Theta hat (MLE)	12761.141	Theta star (bias corrected MLE)	13439.278
nu hat (MLE)	613.81659	nu star (bias corrected)	582.84379
MLE Mean (bias corrected)	68710.526	MLE Sd (bias corrected)	30387.825
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	4.1935424	nu hat (KM)	503.22509
Approximate Chi Square Value (503.23, α)	452.20428	Adjusted Chi Square Value (503.23, β)	451.02131
95% Gamma Approximate KM-UCL (use when n>=50)	72727.689	95% Gamma Adjusted KM-UCL (use when n<50)	72918.445
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	17352.161	Mean	66142.608
Maximum	149000.00	Median	64250.000
SD	30748.892	CV	0.4648878
k hat (MLE)	4.2693940	k star (bias corrected MLE)	4.0670354
Theta hat (MLE)	15492.271	Theta star (bias corrected MLE)	16263.101
nu hat (MLE)	512.32728	nu star (bias corrected)	488.04425
MLE Mean (bias corrected)	66142.608	MLE Sd (bias corrected)	32797.621
		Adjusted Level of Significance (β)	0.0460000
Approximate Chi Square Value (488.04, α)	437.81694	Adjusted Chi Square Value (488.04, β)	436.65329
95% Gamma Approximate UCL (use when n>=50)	73730.631	95% Gamma Adjusted UCL (use when n<50)	73927.119
Lognormal GOF Test on Detected Observations Only			
Lilliefors Test Statistic	0.1287625	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1173536	Detected Data Not Lognormal at 5% Significance Level	
Detected Data appear Approximate Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	66359.685	Mean in Log Scale	10.989074
SD in Original Scale	30411.564	SD in Log Scale	0.4988846
95% t UCL (assumes normality of ROS data)	72920.590	95% Percentile Bootstrap UCL	72716.037
95% BCA Bootstrap UCL	73298.124	95% Bootstrap t UCL	73130.945
95% H-UCL (Log ROS)	75827.480		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	10.858094	95% H-UCL (KM -Log)	102947.44
KM SD (logged)	0.9131165	95% Critical H Value (KM-Log)	2.2459157
KM Standard Error of Mean (logged)	0.1189307		
DL/2 Statistics			

UCL Statistics for Soil Data Sets with Non-Detects			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	65417.333	Mean in Log Scale	10.863809
SD in Original Scale	32062.576	SD in Log Scale	0.9239198
95% t UCL (Assumes normality)	72334.423	95% H-Stat UCL	105058.09

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Approximate Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	72300.244	95% KM (Percentile Bootstrap) UCL	71930.000

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

PYRENE

General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	24.000000
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	280.00000	Minimum Non-Detect	37.000000
Maximum Detect	3500.0000	Maximum Non-Detect	100.00000
Variance Detects	2800133.3	Percent Non-Detects	95.454545%
Mean Detects	1626.6667	SD Detects	1673.3599
Median Detects	1100.0000	CV Detects	1.0287049
Skewness Detects	1.2760140	Kurtosis Detects	N/A
Mean of Logged Detects	6.9327911	SD of Logged Detects	1.2643299

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9256882	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2901856	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	109.25758	Standard Error of Mean	66.485957
SD	441.01794	95% KM (BCA) UCL	N/A
95% KM (t) UCL	220.19843	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	218.61724	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	308.71545	95% KM Chebyshev UCL	399.06314
97.5% KM Chebyshev UCL	524.46224	99% KM Chebyshev UCL	770.78449

UCL Statistics for Soil Data Sets with Non-Detects			
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.2232028	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1329.8422	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.3392166	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.0613749	nu hat (KM)	8.1014831
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (8.10, α)	2.7939252	Adjusted Chi Square Value (8.10, β)	2.7247378
95% Gamma Approximate KM-UCL (use when n>=50)	316.81178	95% Gamma Adjusted KM-UCL (use when n<50)	324.85636
Gamma (KM) may not be used when k hat (KM) is < 0.1			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9976638	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1888294	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	74.334585	Mean in Log Scale	-3.986684
SD in Original Scale	450.19354	SD in Log Scale	4.0013526
95% t UCL (assumes normality of ROS data)	166.80204	95% Percentile Bootstrap UCL	176.03081
95% BCA Bootstrap UCL	254.47569	95% Bootstrap t UCL	987.78680
95% H-UCL (Log ROS)	750.01547		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	3.7619121	95% H-UCL (KM -Log)	67.271550
KM SD (logged)	0.7261024	95% Critical H Value (KM-Log)	2.0342992
KM Standard Error of Mean (logged)	0.1094641		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	100.15909	Mean in Log Scale	3.4213786
SD in Original Scale	446.01069	SD in Log Scale	0.8670804
95% t UCL (Assumes normality)	191.76741	95% H-Stat UCL	56.223416
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	220.19843	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			

UCL Statistics for Soil Data Sets with Non-Detects			
Recommendations are based upon data size, data distribution, and skewness.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
SELENIUM			
General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	53.000000
Number of Detects	21.000000	Number of Non-Detects	45.000000
Number of Distinct Detects	18.000000	Number of Distinct Non-Detects	36.000000
Minimum Detect	150.00000	Minimum Non-Detect	100.00000
Maximum Detect	1400.0000	Maximum Non-Detect	711.00000
Variance Detects	105635.41	Percent Non-Detects	68.181818%
Mean Detects	454.71429	SD Detects	325.01602
Median Detects	360.00000	CV Detects	0.7147698
Skewness Detects	1.6851417	Kurtosis Detects	2.6195581
Mean of Logged Detects	5.9225240	SD of Logged Detects	0.6219895
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8039847	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9080000	Detected Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2335101	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1933411	Detected Data Not Normal at 5% Significance Level	
Detected Data Not Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	297.91638	Standard Error of Mean	36.445327
SD	238.41392	95% KM (BCA) UCL	359.04182
95% KM (t) UCL	358.73036	95% KM (Percentile Bootstrap) UCL	357.74621
95% KM (z) UCL	357.86360	95% KM Bootstrap t UCL	366.81061
90% KM Chebyshev UCL	407.25236	95% KM Chebyshev UCL	456.77787
97.5% KM Chebyshev UCL	525.51737	99% KM Chebyshev UCL	660.54280
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.6223800	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7507755	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1663614	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1911901	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.6912245	k star (bias corrected MLE)	2.3385099
Theta hat (MLE)	168.96186	Theta star (bias corrected MLE)	194.44617
nu hat (MLE)	113.03143	nu star (bias corrected)	98.217414
MLE Mean (bias corrected)	454.71429	MLE Sd (bias corrected)	297.35072
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	1.5614409	nu hat (KM)	206.11020
Approximate Chi Square Value (206.11, α)	173.88945	Adjusted Chi Square Value (206.11, β)	173.23206
95% Gamma Approximate KM-UCL (use when n>=50)	353.11862	95% Gamma Adjusted KM-UCL (use when n<50)	354.45865

UCL Statistics for Soil Data Sets with Non-Detects			
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	254.03678
Maximum	1400.0000	Median	189.39447
SD	238.68816	CV	0.9395811
k hat (MLE)	0.5967904	k star (bias corrected MLE)	0.5797645
Theta hat (MLE)	425.67173	Theta star (bias corrected MLE)	438.17234
nu hat (MLE)	78.776326	nu star (bias corrected)	76.528918
MLE Mean (bias corrected)	254.03678	MLE Sd (bias corrected)	333.63436
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (76.53, α)	57.378103	Adjusted Chi Square Value (76.53, β)	57.008575
95% Gamma Approximate UCL (use when n>=50)	338.82542	95% Gamma Adjusted UCL (use when n<50)	341.02167
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9548029	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9080000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1225388	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1933411	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	280.35791	Mean in Log Scale	5.4606350
SD in Original Scale	221.56291	SD in Log Scale	0.5435402
95% t UCL (assumes normality of ROS data)	325.86580	95% Percentile Bootstrap UCL	324.91489
95% BCA Bootstrap UCL	336.42752	95% Bootstrap t UCL	347.40905
95% H-UCL (Log ROS)	309.85860		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	5.4506738	95% H-UCL (KM -Log)	348.92733
KM SD (logged)	0.6845767	95% Critical H Value (KM-Log)	2.0005252
KM Standard Error of Mean (logged)	0.1236944		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	330.08333	Mean in Log Scale	5.6168568
SD in Original Scale	214.38600	SD in Log Scale	0.6570568
95% t UCL (Assumes normality)	374.11712	95% H-Stat UCL	401.00808
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Gamma Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	358.73036	95% GROS Approximate Gamma UCL	338.82542
95% Approximate Gamma KM-UCL	353.11862		

UCL Statistics for Soil Data Sets with Non-Detects

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

SILVER

General Statistics

Total Number of Observations	66.000000	Number of Distinct Observations	23.000000
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	20.000000
Minimum Detect	140.00000	Minimum Non-Detect	10.000000
Maximum Detect	986.00000	Maximum Non-Detect	123.00000
Variance Detects	198289.33	Percent Non-Detects	95.454545%
Mean Detects	643.33333	SD Detects	445.29690
Median Detects	804.00000	CV Detects	0.6921714
Skewness Detects	-1.412267	Kurtosis Detects	N/A
Mean of Logged Detects	6.1749660	SD of Logged Detects	1.0729516

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9023459	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3075452	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	38.787879	Standard Error of Mean	23.067268
SD	153.01094	95% KM (BCA) UCL	N/A
95% KM (t) UCL	77.278751	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	76.730158	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	107.98968	95% KM Chebyshev UCL	139.33577
97.5% KM Chebyshev UCL	182.84292	99% KM Chebyshev UCL	268.30429

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.8634791	k star (bias corrected MLE)	N/A
Theta hat (MLE)	345.23239	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11.180874	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	0.0642609	nu hat (KM)	8.4824440
		Adjusted Level of Significance (β)	0.0463636

UCL Statistics for Soil Data Sets with Non-Detects			
Approximate Chi Square Value (8.48, α)	3.0174802	Adjusted Chi Square Value (8.48, β)	2.9450327
95% Gamma Approximate KM-UCL (use when n>=50)	109.03667	95% Gamma Adjusted KM-UCL (use when n<50)	111.71897
Gamma (KM) may not be used when k hat (KM) is < 0.1			

Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8274414	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.3509259	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	30.433755	Mean in Log Scale	-1.824680
SD in Original Scale	155.82590	SD in Log Scale	2.9797691
95% t UCL (assumes normality of ROS data)	62.439597	95% Percentile Bootstrap UCL	67.996478
95% BCA Bootstrap UCL	79.225269	95% Bootstrap t UCL	281.45670
95% H-UCL (Log ROS)	55.445186		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	2.4786024	95% H-UCL (KM -Log)	20.889743
KM SD (logged)	0.8279551	95% Critical H Value (KM-Log)	2.1218236
KM Standard Error of Mean (logged)	0.1248189		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	65.132576	Mean in Log Scale	3.3289822
SD in Original Scale	150.95393	SD in Log Scale	1.2826277
95% t UCL (Assumes normality)	96.137742	95% H-Stat UCL	89.761526
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	77.278751	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

SODIUM

General Statistics			
Total Number of Observations	64.000000	Number of Distinct Observations	56.000000
		Number of Missing Observations	2.0000000
Number of Detects	15.000000	Number of Non-Detects	49.000000
Number of Distinct Detects	15.000000	Number of Distinct Non-Detects	43.000000
Minimum Detect	40000.000	Minimum Non-Detect	1390.0000

UCL Statistics for Soil Data Sets with Non-Detects			
Maximum Detect	121000.00	Maximum Non-Detect	44600.000
Variance Detects	6.4250E+8	Percent Non-Detects	76.562500%
Mean Detects	60146.667	SD Detects	25347.580
Median Detects	47500.000	CV Detects	0.4214295
Skewness Detects	1.4582213	Kurtosis Detects	1.0718673
Mean of Logged Detects	10.936989	SD of Logged Detects	0.3613499

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.7663159	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8810000	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2882199	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2287642	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	15596.674	Standard Error of Mean	3625.8403
SD	27657.295	95% KM (BCA) UCL	22348.019
95% KM (t) UCL	21649.660	95% KM (Percentile Bootstrap) UCL	21668.397
95% KM (z) UCL	21560.650	95% KM Bootstrap t UCL	22831.598
90% KM Chebyshev UCL	26474.195	95% KM Chebyshev UCL	31401.345
97.5% KM Chebyshev UCL	38240.039	99% KM Chebyshev UCL	51673.329

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.3155300	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7379551	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2664585	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.2217877	Detected Data Not Gamma Distributed at 5% Significance Level
Detected Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	7.5644224	k star (bias corrected MLE)	6.0959824
Theta hat (MLE)	7951.2570	Theta star (bias corrected MLE)	9866.6077
nu hat (MLE)	226.93267	nu star (bias corrected)	182.87947
MLE Mean (bias corrected)	60146.667	MLE Sd (bias corrected)	24360.697

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.3180128	nu hat (KM)	40.705638
Approximate Chi Square Value (40.71, α)	27.085115	Adjusted Chi Square Value (40.71, β)	26.828927
95% Gamma Approximate KM-UCL (use when n>=50)	23439.907	95% Gamma Adjusted KM-UCL (use when n<50)	23663.733

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	14198.360
Maximum	121000.00	Median	0.0100000
SD	28278.980	CV	1.9917075
k hat (MLE)	0.0833327	k star (bias corrected MLE)	0.0898431
Theta hat (MLE)	170381.68	Theta star (bias corrected MLE)	158035.03

UCL Statistics for Soil Data Sets with Non-Detects			
nu hat (MLE)	10.666582	nu star (bias corrected)	11.499919
MLE Mean (bias corrected)	14198.360	MLE Sd (bias corrected)	47369.170
		Adjusted Level of Significance (β)	0.0462500
Approximate Chi Square Value (11.50, α)	4.8995010	Adjusted Chi Square Value (11.50, β)	4.8001522
95% Gamma Approximate UCL (use when n>=50)	33325.841	95% Gamma Adjusted UCL (use when n<50)	34015.586

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.8235309	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8810000	Detected Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2458906	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2287642	Detected Data Not Lognormal at 5% Significance Level

Detected Data Not Lognormal at 5% Significance Level

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	26086.639	Mean in Log Scale	9.9505074
SD in Original Scale	22527.976	SD in Log Scale	0.5898565
95% t UCL (assumes normality of ROS data)	30787.671	95% Percentile Bootstrap UCL	30795.419
95% BCA Bootstrap UCL	32281.586	95% Bootstrap t UCL	32262.709
95% H-UCL (Log ROS)	28783.720		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	24238.906	Mean in Log Scale	9.3180155
SD in Original Scale	24639.593	SD in Log Scale	1.5895573
95% t UCL (Assumes normality)	29380.580	95% H-Stat UCL	65805.664

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	21649.660	95% KM (% Bootstrap) UCL	21668.397

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

THALLIUM

General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	34.000000
		Number of Missing Observations	1.0000000
Number of Detects	2.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	33.000000
Minimum Detect	379.00000	Minimum Non-Detect	20.000000
Maximum Detect	386.00000	Maximum Non-Detect	417.00000
Variance Detects	24.500000	Percent Non-Detects	96.923077%
Mean Detects	382.50000	SD Detects	4.9497475
Median Detects	382.50000	CV Detects	0.0129405

UCL Statistics for Soil Data Sets with Non-Detects			
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	5.9466868	SD of Logged Detects	0.0129409

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	33.160333	Standard Error of Mean	12.962998
SD	67.779534	95% KM (BCA) UCL	N/A
95% KM (t) UCL	54.795745	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	54.482567	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	72.049326	95% KM Chebyshev UCL	89.664730
97.5% KM Chebyshev UCL	114.11423	99% KM Chebyshev UCL	162.14053

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	11943.034	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0320270	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	47772.136	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.2393540	nu hat (KM)	31.116014
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (31.12, α)	19.372332	Adjusted Chi Square Value (31.12, β)	19.161837
95% Gamma Approximate KM-UCL (use when n>=50)	53.262427	95% Gamma Adjusted KM-UCL (use when n<50)	53.847519

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	351.27885	Mean in Log Scale	5.8612499
SD in Original Scale	9.1729403	SD in Log Scale	0.0258102
95% t UCL (assumes normality of ROS data)	353.17779	95% Percentile Bootstrap UCL	353.13898
95% BCA Bootstrap UCL	353.29161	95% Bootstrap t UCL	353.32026
95% H-UCL (Log ROS)	N/A		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	130.84615	Mean in Log Scale	4.2661063
SD in Original Scale	93.609308	SD in Log Scale	1.3846346
95% t UCL (Assumes normality)	150.22474	95% H-Stat UCL	275.67144

DL/2 is not a recommended method, provided for comparisons and historical reasons

UCL Statistics for Soil Data Sets with Non-Detects			
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	54.795745	95% KM (% Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
TOTAL DDD/DDE/DDT			
General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	37.000000
Number of Detects	6.0000000	Number of Non-Detects	60.000000
Number of Distinct Detects	6.0000000	Number of Distinct Non-Detects	31.000000
Minimum Detect	2.9300000	Minimum Non-Detect	0.2990000
Maximum Detect	12.500000	Maximum Non-Detect	7.2000000
Variance Detects	16.707720	Percent Non-Detects	90.909091%
Mean Detects	8.2400000	SD Detects	4.0875078
Median Detects	8.9400000	CV Detects	0.4960568
Skewness Detects	-0.357098	Kurtosis Detects	-2.042235
Mean of Logged Detects	1.9743419	SD of Logged Detects	0.6080553
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8963699	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1911391	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.3617080	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	1.0224893	Standard Error of Mean	0.3433856
SD	2.5456152	95% KM (BCA) UCL	1.6427771
95% KM (t) UCL	1.5954748	95% KM (Percentile Bootstrap) UCL	1.5755000
95% KM (z) UCL	1.5873083	95% KM Bootstrap t UCL	1.4937526
90% KM Chebyshev UCL	2.0526460	95% KM Chebyshev UCL	2.5192723
97.5% KM Chebyshev UCL	3.1669316	99% KM Chebyshev UCL	4.4391327
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4257225	Anderson-Darling GOF Test	
5% A-D Critical Value	0.7001529	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2320665	Kolmogrov-Smirnoff GOF	
5% K-S Critical Value	0.3336694	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	3.8718948	k star (bias corrected MLE)	2.0470585

UCL Statistics for Soil Data Sets with Non-Detects			
Theta hat (MLE)	2.1281570	Theta star (bias corrected MLE)	4.0252879
nu hat (MLE)	46.462738	nu star (bias corrected)	24.564702
MLE Mean (bias corrected)	8.2400000	MLE Sd (bias corrected)	5.7591989
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.1613363	nu hat (KM)	21.296390
Approximate Chi Square Value (21.30, α)	11.812282	Adjusted Chi Square Value (21.30, β)	11.654165
95% Gamma Approximate KM-UCL (use when n>=50)	1.8434483	95% Gamma Adjusted KM-UCL (use when n<50)	1.8684592
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.7581818
Maximum	12.500000	Median	0.0100000
SD	2.6399032	CV	3.4818867
k hat (MLE)	0.1976506	k star (bias corrected MLE)	0.1987675
Theta hat (MLE)	3.8359706	Theta star (bias corrected MLE)	3.8144159
nu hat (MLE)	26.089877	nu star (bias corrected)	26.237307
MLE Mean (bias corrected)	0.7581818	MLE Sd (bias corrected)	1.7005942
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (26.24, α)	15.562202	Adjusted Chi Square Value (26.24, β)	15.378247
95% Gamma Approximate UCL (use when n>=50)	1.2782670	95% Gamma Adjusted UCL (use when n<50)	1.2935576
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8695805	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2208069	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3617080	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1.0872851	Mean in Log Scale	-0.962266
SD in Original Scale	2.5597726	SD in Log Scale	1.1936515
95% t UCL (assumes normality of ROS data)	1.6130493	95% Percentile Bootstrap UCL	1.6349987
95% BCA Bootstrap UCL	1.7748638	95% Bootstrap t UCL	1.9469617
95% H-UCL (Log ROS)	1.0806750		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-0.916858	95% H-UCL (KM -Log)	0.7960924
KM SD (logged)	0.9310671	95% Critical H Value (KM-Log)	2.2113276
KM Standard Error of Mean (logged)	0.1257566		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	1.0171212	Mean in Log Scale	-1.157629
SD in Original Scale	2.6006531	SD in Log Scale	1.1343529
95% t UCL (Assumes normality)	1.5512821	95% H-Stat UCL	0.8203184
DL/2 is not a recommended method, provided for comparisons and historical reasons			

UCL Statistics for Soil Data Sets with Non-Detects			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	1.5954748	95% KM (Percentile Bootstrap) UCL	1.5755000
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
TRICHLOROFLUOROMETHANE			
General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	26.000000
Number of Detects	5.0000000	Number of Non-Detects	61.000000
Number of Distinct Detects	4.0000000	Number of Distinct Non-Detects	23.000000
Minimum Detect	2.0000000	Minimum Non-Detect	0.4300000
Maximum Detect	7.0000000	Maximum Non-Detect	2.0000000
Variance Detects	3.3000000	Percent Non-Detects	92.424242%
Mean Detects	4.4000000	SD Detects	1.8165902
Median Detects	4.0000000	CV Detects	0.4128614
Skewness Detects	0.2669003	Kurtosis Detects	1.0743802
Mean of Logged Detects	1.4042168	SD of Logged Detects	0.4587510
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9624420	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2128605	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	0.7307576	Standard Error of Mean	0.1571257
SD	1.1417322	95% KM (BCA) UCL	N/A
95% KM (t) UCL	0.9929432	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	0.9892064	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1.2021348	95% KM Chebyshev UCL	1.4156527
97.5% KM Chebyshev UCL	1.7120074	99% KM Chebyshev UCL	2.2941388
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.2919958	Anderson-Darling GOF Test	
5% A-D Critical Value	0.6801159	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2560062	Kolmogrov-Smirnoff GOF	
5% K-S Critical Value	0.3580763	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	6.6231890	k star (bias corrected MLE)	2.7826089

UCL Statistics for Soil Data Sets with Non-Detects			
Theta hat (MLE)	0.6643325	Theta star (bias corrected MLE)	1.5812499
nu hat (MLE)	66.231890	nu star (bias corrected)	27.826089
MLE Mean (bias corrected)	4.4000000	MLE Sd (bias corrected)	2.6377072
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.4096549	nu hat (KM)	54.074445
Approximate Chi Square Value (54.07, α)	38.178877	Adjusted Chi Square Value (54.07, β)	37.880830
95% Gamma Approximate KM-UCL (use when n>=50)	1.0350045	95% Gamma Adjusted KM-UCL (use when n<50)	1.0431479
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.3484046
Maximum	7.0000000	Median	0.0100000
SD	1.2536122	CV	3.5981505
k hat (MLE)	0.2358581	k star (bias corrected MLE)	0.2352383
Theta hat (MLE)	1.4771789	Theta star (bias corrected MLE)	1.4810710
nu hat (MLE)	31.133269	nu star (bias corrected)	31.051454
MLE Mean (bias corrected)	0.3484046	MLE Sd (bias corrected)	0.7183397
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (31.05, α)	19.321333	Adjusted Chi Square Value (31.05, β)	19.114411
95% Gamma Approximate UCL (use when n>=50)	0.5599236	95% Gamma Adjusted UCL (use when n<50)	0.5659850
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9334170	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2844181	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	0.6176763	Mean in Log Scale	-1.273295
SD in Original Scale	1.2069806	SD in Log Scale	1.1129962
95% t UCL (assumes normality of ROS data)	0.8655839	95% Percentile Bootstrap UCL	0.8817933
95% BCA Bootstrap UCL	0.9329182	95% Bootstrap t UCL	1.0565721
95% H-UCL (Log ROS)	0.7099228		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-0.673653	95% H-UCL (KM -Log)	0.7084644
KM SD (logged)	0.6055176	95% Critical H Value (KM-Log)	1.9395676
KM Standard Error of Mean (logged)	0.0833316		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	0.7840152	Mean in Log Scale	-0.726754
SD in Original Scale	1.1780147	SD in Log Scale	0.8366191
95% t UCL (Assumes normality)	1.0259733	95% H-Stat UCL	0.8557335
DL/2 is not a recommended method, provided for comparisons and historical reasons			

UCL Statistics for Soil Data Sets with Non-Detects			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	0.9929432	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			
VANADIUM			
General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	55.000000
		Number of Missing Observations	3.0000000
Minimum	323.00000	Mean	5130.5238
Maximum	11500.000	Median	4700.0000
SD	2304.5755	Std. Error of Mean	290.34922
Coefficient of Variation	0.4491891	Skewness	0.8762321
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9374956	Shapiro Wilk GOF Test	
5% Shapiro Wilk P Value	0.0047391	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1112678	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	5615.3501	95% Adjusted-CLT UCL (Chen-1995)	5642.3549
		95% Modified-t UCL (Johnson-1978)	5620.6923
Gamma GOF Test			
A-D Test Statistic	0.6132250	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7539080	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0930269	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.1125768	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	4.4650122	k star (bias corrected MLE)	4.2629746
Theta hat (MLE)	1149.0504	Theta star (bias corrected MLE)	1203.5080
nu hat (MLE)	562.59153	nu star (bias corrected)	537.13479
MLE Mean (bias corrected)	5130.5238	MLE Sd (bias corrected)	2484.8795
		Approximate Chi Square Value (0.05)	484.38373
Adjusted Level of Significance	0.0461905	Adjusted Chi Square Value	483.21880

UCL Statistics for Soil Data Sets with Non-Detects			
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	5689.2557	95% Adjusted Gamma UCL (use when n<50)	5702.9711
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8822927	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	1.7822E-6	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1302368	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	5.7776523	Mean of logged Data	8.4268218
Maximum of Logged Data	9.3501023	SD of logged Data	0.5456089
Assuming Lognormal Distribution			
95% H-UCL	6044.1550	90% Chebyshev (MVUE) UCL	6444.4758
95% Chebyshev (MVUE) UCL	6968.8592	97.5% Chebyshev (MVUE) UCL	7696.6830
99% Chebyshev (MVUE) UCL	9126.3520		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	5608.1058	95% Jackknife UCL	5615.3501
95% Standard Bootstrap UCL	5590.0595	95% Bootstrap-t UCL	5635.3367
95% Hall's Bootstrap UCL	5656.3872	95% Percentile Bootstrap UCL	5594.0635
95% BCA Bootstrap UCL	5599.0476		
90% Chebyshev(Mean, Sd) UCL	6001.5715	95% Chebyshev(Mean, Sd) UCL	6396.1267
97.5% Chebyshev(Mean, Sd) UCL	6943.7541	99% Chebyshev(Mean, Sd) UCL	8019.4621
Suggested UCL to Use			
95% Student's-t UCL	5615.3501		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
ZINC			
General Statistics			
Total Number of Observations	66.000000	Number of Distinct Observations	50.000000
Number of Detects	28.000000	Number of Non-Detects	38.000000
Number of Distinct Detects	25.000000	Number of Distinct Non-Detects	25.000000
Minimum Detect	1600.0000	Minimum Non-Detect	150.00000
Maximum Detect	18000.000	Maximum Non-Detect	221.00000
Variance Detects	19580488	Percent Non-Detects	57.575758%
Mean Detects	5620.7143	SD Detects	4424.9846
Median Detects	3300.0000	CV Detects	0.7872637

UCL Statistics for Soil Data Sets with Non-Detects			
Skewness Detects	1.3604884	Kurtosis Detects	1.1659082
Mean of Logged Detects	8.3703761	SD of Logged Detects	0.7238704

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8206681	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9240000	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2278306	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1674383	Detected Data Not Normal at 5% Significance Level
Detected Data Not Normal at 5% Significance Level		

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	2470.9091	Standard Error of Mean	490.64030
SD	3914.1552	95% KM (BCA) UCL	3274.8485
95% KM (t) UCL	3289.6091	95% KM (Percentile Bootstrap) UCL	3299.6970
95% KM (z) UCL	3277.9406	95% KM Bootstrap t UCL	3506.1703
90% KM Chebyshev UCL	3942.8300	95% KM Chebyshev UCL	4609.5606
97.5% KM Chebyshev UCL	5534.9568	99% KM Chebyshev UCL	7352.7184

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.9767189	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7577717	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1985777	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.1675148	Detected Data Not Gamma Distributed at 5% Significance Level
Detected Data Not Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.0461240	k star (bias corrected MLE)	1.8507059
Theta hat (MLE)	2747.0057	Theta star (bias corrected MLE)	3037.0650
nu hat (MLE)	114.58294	nu star (bias corrected)	103.63953
MLE Mean (bias corrected)	5620.7143	MLE Sd (bias corrected)	4131.6431

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.3985084	nu hat (KM)	52.603104
Approximate Chi Square Value (52.60, α)	36.942834	Adjusted Chi Square Value (52.60, β)	36.649948
95% Gamma Approximate KM-UCL (use when n>=50)	3518.3410	95% Gamma Adjusted KM-UCL (use when n<50)	3546.4576

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	2384.5512
Maximum	18000.000	Median	0.0100000
SD	3996.1128	CV	1.6758343
k hat (MLE)	0.1158575	k star (bias corrected MLE)	0.1206922
Theta hat (MLE)	20581.768	Theta star (bias corrected MLE)	19757.291
nu hat (MLE)	15.293184	nu star (bias corrected)	15.931372
MLE Mean (bias corrected)	2384.5512	MLE Sd (bias corrected)	6863.8380
		Adjusted Level of Significance (β)	0.0463636
Approximate Chi Square Value (15.93, α)	7.9137812	Adjusted Chi Square Value (15.93, β)	7.7872853

UCL Statistics for Soil Data Sets with Non-Detects			
95% Gamma Approximate UCL (use when n>=50)	4800.3820	95% Gamma Adjusted UCL (use when n<50)	4878.3590

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9271434	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9240000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1649977	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1674383	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	2729.0983	Mean in Log Scale	7.1981866
SD in Original Scale	3796.4711	SD in Log Scale	1.1486656
95% t UCL (assumes normality of ROS data)	3508.8740	95% Percentile Bootstrap UCL	3523.3944
95% BCA Bootstrap UCL	3731.4833	95% Bootstrap t UCL	3749.9190
95% H-UCL (Log ROS)	3558.6028		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	6.4359799	95% H-UCL (KM -Log)	4874.6926
KM SD (logged)	1.7238155	95% Critical H Value (KM-Log)	2.6661729
KM Standard Error of Mean (logged)	0.2160807		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2439.7727	Mean in Log Scale	6.1771233
SD in Original Scale	3962.8042	SD in Log Scale	1.9543837
95% t UCL (Assumes normality)	3253.7125	95% H-Stat UCL	6640.3451
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 (t) UCL	3289.6091	95% KM (% Bootstrap) UCL	3299.6970

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

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Appendix C6
ProUCL Output Soil BTV Calculations,
Outliers Removed

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	Background Statistics for Soil Data Sets with Non-Detects		
User Selected Options			
Date/Time of Computation	3/24/2015 8:55:40 AM		
From File	C1 Soil ProUCL Dataset deleted outliers 03.23.xls		
Full Precision	ON		
Confidence Coefficient	95%		
Coverage	95%		
Different or Future K Observations	1		
Number of Bootstrap Operations	2000		

4,4'-DDE

General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	31.000000		
Number of Detects	4.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	4.0000000	Number of Distinct Non-Detects	27.000000
Minimum Detect	2.4000000	Minimum Non-Detect	0.1830000
Maximum Detect	12.100000	Maximum Non-Detect	5.4000000
Variance Detected	17.714692	Percent Non-Detects	93.939394%
Mean Detected	7.2025000	SD Detected	4.2088825
Mean of Detected Logged Data	1.8107436	SD of Detected Logged Data	0.7062469

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9893603	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1649042	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.4430000	Detected Data appear Normal at 5% Significance Level
Detected Data appear Normal at 5% Significance Level		

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	0.6089660	SD	1.9003244
95% UTL95% Coverage	4.4038648	95% KM UPL (t)	3.8038477
90% KM Percentile (z)	3.0443297	95% KM Percentile (z)	3.7347215
99% KM Percentile (z)	5.0297817	95% KM USL	6.4284225

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.6265682	SD	1.9378467
95% UTL95% Coverage	4.4963980	95% UPL (t)	3.8845335
90% Percentile (z)	3.1100187	95% Percentile (z)	3.8140424
99% Percentile (z)	5.1346738	95% USL	6.5609311
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.2309290	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.6592978	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2180318	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.3964753	Detected data appear Gamma Distributed at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	3.2117011	k star (bias corrected MLE)	0.9695919
Theta hat (MLE)	2.2425810	Theta star (bias corrected MLE)	7.4283827
nu hat (MLE)	25.693609	nu star (bias corrected)	7.7567355
MLE Mean (bias corrected)	7.2025000		
MLE Sd (bias corrected)	7.3145695	95% Percentile of Chisquare (2k)	5.8731289
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.4459091
Maximum	12.100000	Median	0.0100000
SD	1.9514539	CV	4.3763492
k hat (MLE)	0.2136676	k star (bias corrected MLE)	0.2140565
Theta hat (MLE)	2.0869285	Theta star (bias corrected MLE)	2.0831374
nu hat (MLE)	28.204129	nu star (bias corrected)	28.255457
MLE Mean (bias corrected)	0.4459091	MLE Sd (bias corrected)	0.9637894
95% Percentile of Chisquare (2k)	2.1662915	90% Percentile	1.3480145
95% Percentile	2.2563414	99% Percentile	4.7301434
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.4335588	1.0660928	95% Approx. Gamma UPL	0.9974648	0.7091856
95% Gamma USL	3.8023283	3.3050090			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.1026906	nu hat (KM)	13.555158		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	2.1474497	1.8866506	95% Approx. Gamma UPL	1.6783607	1.4592734
95% Gamma USL	4.3586239	4.0424035			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.9546400	Shapiro Wilk GOF Test			
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.2024331	Lilliefors GOF Test			
5% Lilliefors Critical Value	0.4430000	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	0.5227310	Mean in Log Scale	-2.766822		
SD in Original Scale	1.9372256	SD in Log Scale	1.6784457		
95% UTL95% Coverage	1.7949734	95% BCA UTL95% Coverage	8.0275000		
95% Bootstrap (%) UTL95% Coverage	8.9000000	95% UPL (t)	1.0565724		
90% Percentile (z)	0.5402043	95% Percentile (z)	0.9939931		
99% Percentile (z)	3.1199784	95% USL	10.731292		

Background Statistics for Soil Data Sets with Non-Detects			
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	-1.484973	95% KM UTL (Lognormal)95% Coverage	1.2404151
KM SD of Logged Data	0.8514976	95% KM UPL (Lognormal)	0.9479916
95% KM Percentile Lognormal (z)	0.9190785	95% KM USL (Lognormal)	3.0728645
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	0.6265682	Mean in Log Scale	-1.681052
SD in Original Scale	1.9378467	SD in Log Scale	1.0841966
95% UTL95% Coverage	1.6226492	95% UPL (t)	1.1522666
90% Percentile (z)	0.7470683	95% Percentile (z)	1.1077071
99% Percentile (z)	2.3190694	95% USL	5.1507165
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	8.9000000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	5.4065000	95% USL	12.100000
95% KM Chebyshev UPL	8.9548046		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations. The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.			

4,4'-DDT

General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	36.000000		
Number of Detects	5.0000000	Number of Non-Detects	61.000000
Number of Distinct Detects	5.0000000	Number of Distinct Non-Detects	31.000000
Minimum Detect	1.8000000	Minimum Non-Detect	0.2990000
Maximum Detect	5.2000000	Maximum Non-Detect	7.2000000
Variance Detected	1.9772300	Percent Non-Detects	92.424242%
Mean Detected	3.7660000	SD Detected	1.4061401
Mean of Detected Logged Data	1.2576616	SD of Detected Logged Data	0.4357196
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9407967	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1838107	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Background Statistics for Soil Data Sets with Non-Detects			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	0.5656923	SD	0.9875085
95% UTL95% Coverage	2.5377214	95% KM UPL (t)	2.2259209
90% KM Percentile (z)	1.8312354	95% KM Percentile (z)	2.1899993
99% KM Percentile (z)	2.8629807	95% KM USL	3.5897881
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.5557955	SD	1.0772975
95% UTL95% Coverage	2.7071308	95% UPL (t)	2.3669800
90% Percentile (z)	1.9364078	95% Percentile (z)	2.3277922
99% Percentile (z)	3.0619643	95% USL	3.8548565
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.3175794	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.6798031	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2213269	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.3579532	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	7.4778438	k star (bias corrected MLE)	3.1244709
Theta hat (MLE)	0.5036211	Theta star (bias corrected MLE)	1.2053241
nu hat (MLE)	74.778438	nu star (bias corrected)	31.244709
MLE Mean (bias corrected)	3.7660000		
MLE Sd (bias corrected)	2.1305517	95% Percentile of Chisquare (2k)	12.962702
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.2945455
Maximum	5.2000000	Median	0.0100000
SD	1.0604994	CV	3.6004610
k hat (MLE)	0.2428366	k star (bias corrected MLE)	0.2418995
Theta hat (MLE)	1.2129371	Theta star (bias corrected MLE)	1.2176355
nu hat (MLE)	32.054425	nu star (bias corrected)	31.930739
MLE Mean (bias corrected)	0.2945455	MLE Sd (bias corrected)	0.5988731
95% Percentile of Chisquare (2k)	2.3647162	90% Percentile	0.8860169
95% Percentile	1.4396812	99% Percentile	2.9203801
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.0762476	0.8679958	95% Approx. Gamma UPL	0.7600809	0.5869983
95% Gamma USL	2.7635696	2.5903183			

The following statistics are computed using gamma distribution and KM estimates	
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods	

Background Statistics for Soil Data Sets with Non-Detects					
k hat (KM)	0.3281548		nu hat (KM)		43.316439
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.7588910	1.6567903	95% Approx. Gamma UPL	1.4524689	1.3595183
95% Gamma USL	3.1049335	3.0284555			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9020439	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2226195	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3962312	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	0.5619750	Mean in Log Scale	-1.190141
SD in Original Scale	1.0041647	SD in Log Scale	0.9333865
95% UTL95% Coverage	1.9616921	95% BCA UTL95% Coverage	4.6600000
95% Bootstrap (%) UTL95% Coverage	4.8700000	95% UPL (t)	1.4609629
90% Percentile (z)	1.0060599	95% Percentile (z)	1.4121916
99% Percentile (z)	2.6677632	95% USL	5.3026877

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	-1.017698	95% KM UTL (Lognormal)95% Coverage	1.3656565
KM SD of Logged Data	0.6656739	95% KM UPL (Lognormal)	1.1067771
95% KM Percentile Lognormal (z)	1.0802989	95% KM USL (Lognormal)	2.7754904

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	0.5557955	Mean in Log Scale	-1.269369
SD in Original Scale	1.0772975	SD in Log Scale	0.8984894
95% UTL95% Coverage	1.6902747	95% UPL (t)	1.2727729
90% Percentile (z)	0.8887773	95% Percentile (z)	1.2318468
99% Percentile (z)	2.2723849	95% USL	4.4022646
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	5.2000000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	4.5760000	95% USL	7.2000000
95% KM Chebyshev UPL	4.9026292		

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

ALPHA-CHLORDANE

General Statistics

Background Statistics for Soil Data Sets with Non-Detects			
Total Number of Observations	63.000000	Number of Missing Observations	3.0000000
Number of Distinct Observations	42.000000		
Number of Detects	17.000000	Number of Non-Detects	46.000000
Number of Distinct Detects	17.000000	Number of Distinct Non-Detects	25.000000
Minimum Detect	0.8620000	Minimum Non-Detect	0.1450000
Maximum Detect	5.7100000	Maximum Non-Detect	0.6500000
Variance Detected	1.7240005	Percent Non-Detects	73.015873%
Mean Detected	2.9471765	SD Detected	1.3130120
Mean of Detected Logged Data	0.9783345	SD of Detected Logged Data	0.4861896

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0065013	d2max (for USL)	3.0451154

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9534680	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8920000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2041912	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2148866	Detected Data appear Normal at 5% Significance Level
Detected Data appear Normal at 5% Significance Level		

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	0.9011429	SD	1.4088773
95% UTL95% Coverage	3.7280569	95% KM UPL (t)	3.2722894
90% KM Percentile (z)	2.7066917	95% KM Percentile (z)	3.2185397
99% KM Percentile (z)	4.1786815	95% KM USL	5.1913367

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.9150794	SD	1.4150579
95% UTL95% Coverage	3.7543948	95% UPL (t)	3.2966279
90% Percentile (z)	2.7285490	95% Percentile (z)	3.2426424
99% Percentile (z)	4.2069962	95% USL	5.2240939
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.2845157	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7415290	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1510378	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.2097238	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	5.0381534	k star (bias corrected MLE)	4.1882832
Theta hat (MLE)	0.5849716	Theta star (bias corrected MLE)	0.7036717
nu hat (MLE)	171.29722	nu star (bias corrected)	142.40163
MLE Mean (bias corrected)	2.9471765		
MLE Sd (bias corrected)	1.4400850	95% Percentile of Chisquare (2k)	16.041947

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 detected data is small such as < 0.1

Background Statistics for Soil Data Sets with Non-Detects			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.8380984
Maximum	5.7100000	Median	0.0100000
SD	1.4595728	CV	1.7415292
k hat (MLE)	0.2712186	k star (bias corrected MLE)	0.2688855
Theta hat (MLE)	3.0901212	Theta star (bias corrected MLE)	3.1169347
nu hat (MLE)	34.173546	nu star (bias corrected)	33.879567
MLE Mean (bias corrected)	0.8380984	MLE Sd (bias corrected)	1.6162605
95% Percentile of Chisquare (2k)	2.5462560	90% Percentile	2.5007428
95% Percentile	3.9682569	99% Percentile	7.8361894

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	4.5451802	5.0070702	95% Approx. Gamma UPL	3.2639414	3.3695906
95% Gamma USL	10.826809	14.418289			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)		0.4091108	nu hat (KM)		51.547965
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	3.8994409	3.9827315	95% Approx. Gamma UPL	3.0051530	2.9766681
95% Gamma USL	7.9316259	8.9802778			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9586398	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8920000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1231265	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2148866	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	1.2107031	Mean in Log Scale	-0.195900
SD in Original Scale	1.2679419	SD in Log Scale	0.8255153
95% UTL95% Coverage	4.3081010	95% BCA UTL95% Coverage	4.6290000
95% Bootstrap (%) UTL95% Coverage	4.6500000	95% UPL (t)	3.2984264
90% Percentile (z)	2.3679867	95% Percentile (z)	3.1961645
99% Percentile (z)	5.6099141	95% USL	10.154216

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-1.145957	95% KM UTL (Lognormal)95% Coverage	4.4435692
KM SD of Logged Data	1.3144348	95% KM UPL (Lognormal)	2.9044447
95% KM Percentile Lognormal (z)	2.7623882	95% KM USL (Lognormal)	17.403102

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.9150794	Mean in Log Scale	-1.187908
SD in Original Scale	1.4150579	SD in Log Scale	1.4468831
95% UTL95% Coverage	5.5581507	95% UPL (t)	3.4805944
90% Percentile (z)	1.9471132	95% Percentile (z)	3.2936734
99% Percentile (z)	8.8290378	95% USL	24.978582

Background Statistics for Soil Data Sets with Non-Detects			
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	62.000000	95% UTL with95% Coverage	4.6500000
Approximate f	1.6315789	Confidence Coefficient (CC) achieved by UTL	0.8295302
95% UPL	4.4180000	95% USL	5.7100000
95% KM Chebyshev UPL	7.0908438		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
ALUMINUM			
General Statistics			
Total Number of Observations	63.000000	Number of Distinct Observations	58.000000
		Number of Missing Observations	3.0000000
Minimum	127000.00	First Quartile	2780000.0
Second Largest	9080000.0	Median	4030000.0
Maximum	9360000.0	Third Quartile	4695000.0
Mean	3869603.2	SD	1749415.2
Coefficient of Variation	0.4520916	Skewness	0.5111715
Mean of logged Data	15.021194	SD of logged Data	0.6596391
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0065013	d2max (for USL)	3.0451154
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9568701	Normal GOF Test	
5% Shapiro Wilk P Value	0.0634131	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1022129	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	7379807.1	90% Percentile (z)	6111568.9
95% UPL (t)	6813876.5	95% Percentile (z)	6747135.1
95% USL	9196774.4	99% Percentile (z)	7939351.5
Gamma GOF Test			
A-D Test Statistic	1.7724600	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7558422	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1502145	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.1128167	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			

Background Statistics for Soil Data Sets with Non-Detects			
Gamma Statistics			
k hat (MLE)	3.5485712	k star (bias corrected MLE)	3.3901737
Theta hat (MLE)	1090467.9	Theta star (bias corrected MLE)	1141417.4
nu hat (MLE)	447.11998	nu star (bias corrected)	427.16188
MLE Mean (bias corrected)	3869603.2	MLE Sd (bias corrected)	2101626.1
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	7862384.8	90% Percentile	6687680.8
95% Hawkins Wixley (HW) Approx. Gamma UPL	8197954.8	95% Percentile	7845163.7
95% WH Approx. Gamma UTL with 95% Coverage	8965864.9	99% Percentile	10338093
95% HW Approx. Gamma UTL with 95% Coverage	9473685.4		
95% WH USL	13196869	95% HW USL	14590966
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8159339	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	1.886E-10	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1809637	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	12544092	90% Percentile (z)	7776019.6
95% UPL (t)	10133619	95% Percentile (z)	9881781.6
95% USL	24887364	99% Percentile (z)	15490595
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	62.000000	95% UTL with 95% Coverage	9080000.0
Approximate f	1.6315789	Confidence Coefficient (CC) achieved by UTL	0.8295302
95% Percentile Bootstrap UTL with 95% Coverage	9080000.0	95% BCA Bootstrap UTL with 95% Coverage	8817000.0
95% UPL	6416000.0	90% Percentile	5816000.0
90% Chebyshev UPL	9159337.5	95% Percentile	6279000.0
95% Chebyshev UPL	11555409	99% Percentile	9186400.0
95% USL	9360000.0		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations. The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.			
ARSENIC			
General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	60.000000		
Number of Detects	48.000000	Number of Non-Detects	17.000000
Number of Distinct Detects	43.000000	Number of Distinct Non-Detects	17.000000
Minimum Detect	250.00000	Minimum Non-Detect	60.000000

Background Statistics for Soil Data Sets with Non-Detects			
Maximum Detect	2400.0000	Maximum Non-Detect	669.00000
Variance Detected	208924.90	Percent Non-Detects	26.153846%
Mean Detected	1037.1042	SD Detected	457.08304
Mean of Detected Logged Data	6.8502153	SD of Detected Logged Data	0.4481968

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9315591	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9470000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1399250	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1278831	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	824.75646	SD	538.52521
95% UTL95% Coverage	1901.8439	95% KM UPL (t)	1730.4495
90% KM Percentile (z)	1514.9043	95% KM Percentile (z)	1710.5516
99% KM Percentile (z)	2077.5534	95% KM USL	2470.8724

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	826.88462	SD	533.06606
95% UTL95% Coverage	1893.0534	95% UPL (t)	1723.3965
90% Percentile (z)	1510.0363	95% Percentile (z)	1703.7003
99% Percentile (z)	2066.9817	95% USL	2456.3136
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.2416902	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7530630	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0834653	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.1281743	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics on Detected Data Only			
k hat (MLE)	5.4819511	k star (bias corrected MLE)	5.1532181
Theta hat (MLE)	189.18523	Theta star (bias corrected MLE)	201.25369
nu hat (MLE)	526.26731	nu star (bias corrected)	494.70893
MLE Mean (bias corrected)	1037.1042		
MLE Sd (bias corrected)	456.85998	95% Percentile of Chisquare (2k)	18.728251

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	161.33856	Mean	842.89190
Maximum	2400.0000	Median	844.00000
SD	513.42915	CV	0.6091281

Background Statistics for Soil Data Sets with Non-Detects			
k hat (MLE)	2.5826138	k star (bias corrected MLE)	2.4736726
Theta hat (MLE)	326.37164	Theta star (bias corrected MLE)	340.74513
nu hat (MLE)	335.73979	nu star (bias corrected)	321.57744
MLE Mean (bias corrected)	842.89190	MLE Sd (bias corrected)	535.92099
95% Percentile of Chisquare (2k)	10.988876	90% Percentile	1560.7828
95% Percentile	1872.2030	99% Percentile	2554.4515

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2189.8523	2278.6141	95% Approx. Gamma UPL	1887.4634	1938.7685
95% Gamma USL	3422.0611	3733.4861			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)	2.3455213		nu hat (KM)		304.91776
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2616.2291	2881.7243	95% Approx. Gamma UPL	2186.2712	2350.8023
95% Gamma USL	4440.6089	5304.3806			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9833542	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9470000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.0887819	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1278831	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	869.76406	Mean in Log Scale	6.6212400
SD in Original Scale	484.24381	SD in Log Scale	0.5507835
95% UTL95% Coverage	2259.3780	95% BCA UTL95% Coverage	2300.0000
95% Bootstrap (%) UTL95% Coverage	2282.0000	95% UPL (t)	1896.0898
90% Percentile (z)	1520.9607	95% Percentile (z)	1857.8928
99% Percentile (z)	2704.1799	95% USL	4043.3383

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	6.3440354	95% KM UTL (Lognormal)95% Coverage	4785.2949
KM SD of Logged Data	1.0645972	95% KM UPL (Lognormal)	3410.0344
95% KM Percentile Lognormal (z)	3278.5020	95% KM USL (Lognormal)	14738.250

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	826.88462	Mean in Log Scale	6.4083211
SD in Original Scale	533.06606	SD in Log Scale	0.9629903
95% UTL95% Coverage	4164.5681	95% UPL (t)	3065.2384
90% Percentile (z)	2084.8304	95% Percentile (z)	2958.0902
99% Percentile (z)	5701.9954	95% USL	11520.740

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	2300.0000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	1804.0000	95% USL	2400.0000
95% KM Chebyshev UPL	3190.1212		

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

BARIUM

General Statistics

Total Number of Observations	66.000000	Number of Distinct Observations	57.000000
Minimum	681.00000	First Quartile	5785.0000
Second Largest	30400.000	Median	10900.000
Maximum	32500.000	Third Quartile	15200.000
Mean	11213.348	SD	6790.8212
Coefficient of Variation	0.6056015	Skewness	1.0388639
Mean of logged Data	9.1187508	SD of logged Data	0.7072789

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test

Shapiro Wilk Test Statistic	0.9201761	**Normal GOF Test**	
5% Shapiro Wilk P Value	2.6819E-4	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0875435	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1090591	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	24774.443	90% Percentile (z)	19916.136
95% UPL (t)	22630.278	95% Percentile (z)	22383.255
95% USL	32009.213	99% Percentile (z)	27011.161

Gamma GOF Test

A-D Test Statistic	0.4096513	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7599986	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0764992	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1107596	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.5803794	k star (bias corrected MLE)	2.4731904
Theta hat (MLE)	4345.6201	Theta star (bias corrected MLE)	4533.9608
nu hat (MLE)	340.61008	nu star (bias corrected)	326.46114
MLE Mean (bias corrected)	11213.348	MLE Sd (bias corrected)	7130.2793

Background Statistics for Soil Data Sets with Non-Detects			
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	25060.718	90% Percentile	20764.672
95% Hawkins Wixley (HW) Approx. Gamma UPL	25841.441	95% Percentile	24908.174
95% WH Approx. Gamma UTL with 95% Coverage	29028.982	99% Percentile	33985.713
95% HW Approx. Gamma UTL with 95% Coverage	30335.386		
95% WH USL	45468.607	95% HW USL	49913.397
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9502410	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0224926	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1134559	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1090591	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	37465.229	90% Percentile (z)	22587.801
95% UPL (t)	29966.912	95% Percentile (z)	29205.757
95% USL	79593.340	99% Percentile (z)	47293.477
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	65.000000	95% UTL with 95% Coverage	30400.000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% Percentile Bootstrap UTL with 95% Coverage	30400.000	95% BCA Bootstrap UTL with 95% Coverage	30400.000
95% UPL	26900.000	90% Percentile	17850.000
90% Chebyshev UPL	31739.569	95% Percentile	25775.000
95% Chebyshev UPL	41037.255	99% Percentile	31135.000
95% USL	32500.000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations. The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.			

BENZO(A)ANTHRACENE

General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	22.000000		
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	19.000000
Minimum Detect	150.00000	Minimum Non-Detect	26.000000
Maximum Detect	2200.0000	Maximum Non-Detect	82.000000
Variance Detected	1202500.0	Percent Non-Detects	95.454545%
Mean Detected	950.00000	SD Detected	1096.5856
Mean of Detected Logged Data	6.3071520	SD of Detected Logged Data	1.3451783
Warning: Data set has only 3 Detected Values.			

Background Statistics for Soil Data Sets with Non-Detects			
This is not enough to compute meaningful or reliable statistics and estimates.			
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8736839	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3258974	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	68.000000	SD	271.07821
95% UTL95% Coverage	609.33617	95% KM UPL (t)	523.74471
90% KM Percentile (z)	415.40070	95% KM Percentile (z)	513.88397
99% KM Percentile (z)	698.62221	95% KM USL	898.13606
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	63.000000	SD	274.09319
95% UTL95% Coverage	610.35702	95% UPL (t)	523.81359
90% Percentile (z)	414.26456	95% Percentile (z)	513.84318
99% Percentile (z)	700.63611	95% USL	902.36900
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.0454100	k star (bias corrected MLE)	N/A
Theta hat (MLE)	908.73439	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.2724599	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	43.191364
Maximum	2200.0000	Median	0.0100000
SD	277.05532	CV	6.4146001
k hat (MLE)	0.1027723	k star (bias corrected MLE)	0.1082019
Theta hat (MLE)	420.26263	Theta star (bias corrected MLE)	399.17396
nu hat (MLE)	13.565946	nu star (bias corrected)	14.282645
MLE Mean (bias corrected)	43.191364	MLE Sd (bias corrected)	131.30448
95% Percentile of Chisquare (2k)	1.2487907	90% Percentile	118.47635
95% Percentile	249.24237	99% Percentile	659.33594

Background Statistics for Soil Data Sets with Non-Detects					
The following statistics are computed using Gamma ROS Statistics on Imputed Data					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	87.226409	45.106745	95% Approx. Gamma UPL	56.142167	26.349227
95% Gamma USL	271.96273	185.64477			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.0629258		nu hat (KM)	8.3062032	
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	215.04288	182.80212	95% Approx. Gamma UPL	171.31200	145.41124
95% Gamma USL	416.24471	363.65251			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.9964311	Shapiro Wilk GOF Test			
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.1940910	Lilliefors GOF Test			
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	43.426671	Mean in Log Scale	-5.480900		
SD in Original Scale	277.02023	SD in Log Scale	4.5066800		
95% UTL95% Coverage	33.744699	95% BCA UTL95% Coverage	412.50000		
95% Bootstrap (%) UTL95% Coverage	412.50000	95% UPL (t)	8.1324620		
90% Percentile (z)	1.3426465	95% Percentile (z)	6.9028114		
99% Percentile (z)	148.88963	95% USL	4105.6798		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution					
KM Mean of Logged Data	3.3966900	95% KM UTL (Lognormal)95% Coverage	115.40615		
KM SD of Logged Data	0.6769080	95% KM UPL (Lognormal)	93.198133		
95% KM Percentile Lognormal (z)	90.931320	95% KM USL (Lognormal)	237.36959		
Background DL/2 Statistics Assuming Lognormal Distribution					
Mean in Original Scale	63.000000	Mean in Log Scale	3.0963545		
SD in Original Scale	274.09319	SD in Log Scale	0.8453938		
95% UTL95% Coverage	119.65158	95% UPL (t)	91.620545		
90% Percentile (z)	65.350834	95% Percentile (z)	88.845908		
99% Percentile (z)	158.06945	95% USL	294.49006		
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.					
Nonparametric Distribution Free Background Statistics					
Data appear to follow a Discernible Distribution at 5% Significance Level					
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)					
Order of Statistic, r	65.000000	95% UTL with95% Coverage	500.00000		
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963		
95% UPL	126.20000	95% USL	2200.0000		
95% KM Chebyshev UPL	1258.5204				

Background Statistics for Soil Data Sets with Non-Detects

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

BENZO(A)PYRENE

General Statistics

Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	22.000000		
Number of Detects	4.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	4.0000000	Number of Distinct Non-Detects	19.000000
Minimum Detect	58.000000	Minimum Non-Detect	36.000000
Maximum Detect	1400.0000	Maximum Non-Detect	63.000000
Variance Detected	372107.67	Percent Non-Detects	93.939394%
Mean Detected	539.50000	SD Detected	610.00628
Mean of Detected Logged Data	5.6678534	SD of Detected Logged Data	1.3915236

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8708002	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2496730	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.4430000	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	66.520528	SD	177.05078
95% UTL95% Coverage	420.08636	95% KM UPL (t)	364.18355
90% KM Percentile (z)	293.42023	95% KM Percentile (z)	357.74315
99% KM Percentile (z)	478.40224	95% KM USL	608.71180

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	53.545455	SD	180.70211
95% UTL95% Coverage	414.40289	95% UPL (t)	357.34719
90% Percentile (z)	285.12452	95% Percentile (z)	350.77397
99% Percentile (z)	473.92142	95% USL	606.91837

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.2312920	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.6675786	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2283890	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.4031167	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.9343762	k star (bias corrected MLE)	0.4002607

Background Statistics for Soil Data Sets with Non-Detects			
Theta hat (MLE)	577.39056	Theta star (bias corrected MLE)	1347.8715
nu hat (MLE)	7.4750096	nu star (bias corrected)	3.2020857
MLE Mean (bias corrected)	539.50000		
MLE Sd (bias corrected)	852.74654	95% Percentile of Chisquare (2k)	3.3253416

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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	32.706364
Maximum	1400.0000	Median	0.0100000
SD	184.38936	CV	5.6377213
k hat (MLE)	0.1076909	k star (bias corrected MLE)	0.1128969
Theta hat (MLE)	303.70594	Theta star (bias corrected MLE)	289.70126
nu hat (MLE)	14.215198	nu star (bias corrected)	14.902386
MLE Mean (bias corrected)	32.706364	MLE Sd (bias corrected)	97.339996
95% Percentile of Chisquare (2k)	1.2976067	90% Percentile	91.001073
95% Percentile	187.95915	99% Percentile	488.56809

The following statistics are computed using Gamma ROS Statistics on Imputed Data					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	76.405705	44.230789	95% Approx. Gamma UPL	49.552652	26.061366
95% Gamma USL	234.62891	178.80588			

The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.1411613		nu hat (KM)		18.633293
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	197.80897	177.38146	95% Approx. Gamma UPL	163.16422	146.25647
95% Gamma USL	350.21873	319.94717			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9848693	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7480000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1730046	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.4430000	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	32.968620	Mean in Log Scale	-3.663224
SD in Original Scale	184.34395	SD in Log Scale	3.7400385
95% UTL95% Coverage	44.949363	95% BCA UTL95% Coverage	445.00000
95% Bootstrap (%) UTL95% Coverage	445.00000	95% UPL (t)	13.799603
90% Percentile (z)	3.0951257	95% Percentile (z)	12.044309
99% Percentile (z)	154.06999	95% USL	2416.5094

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	3.7099588	95% KM UTL (Lognormal)95% Coverage	129.85952
KM SD of Logged Data	0.5791234	95% KM UPL (Lognormal)	108.15855

Background Statistics for Soil Data Sets with Non-Detects			
95% KM Percentile Lognormal (z)	105.90389	95% KM USL (Lognormal)	240.67241

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	53.545455	Mean in Log Scale	3.2470336
SD in Original Scale	180.70211	SD in Log Scale	0.6998158
95% UTL95% Coverage	104.01630	95% UPL (t)	83.394689
90% Percentile (z)	63.047198	95% Percentile (z)	81.298546
99% Percentile (z)	130.98052	95% USL	219.22832

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	65.000000	95% UTL with95% Coverage	540.00000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	126.05000	95% USL	1400.0000
95% KM Chebyshev UPL	844.09158		

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

BENZO(B)FLUORANTHENE

General Statistics

Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	24.000000		
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	22.000000
Minimum Detect	89.000000	Minimum Non-Detect	34.000000
Maximum Detect	540.00000	Maximum Non-Detect	89.000000
Variance Detected	56017.000	Percent Non-Detects	95.384615%
Mean Detected	273.00000	SD Detected	236.67911
Mean of Detected Logged Data	5.3424099	SD of Detected Logged Data	0.9052433

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9077472	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3037546	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	45.030769	SD	65.102043
95% UTL95% Coverage	175.23933	95% KM UPL (t)	154.51955
90% KM Percentile (z)	128.46239	95% KM Percentile (z)	152.11410
99% KM Percentile (z)	196.48077	95% KM USL	244.02891
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	36.000000	SD	67.703974
95% UTL95% Coverage	171.41260	95% UPL (t)	149.86472
90% Percentile (z)	122.76613	95% Percentile (z)	147.36313
99% Percentile (z)	193.50300	95% USL	242.95149
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.0230544	k star (bias corrected MLE)	N/A
Theta hat (MLE)	134.94446	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	12.138327	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	12.609538
Maximum	540.00000	Median	0.0100000
SD	71.292309	CV	5.6538397
k hat (MLE)	0.1188599	k star (bias corrected MLE)	0.1236305
Theta hat (MLE)	106.08739	Theta star (bias corrected MLE)	101.99376
nu hat (MLE)	15.451789	nu star (bias corrected)	16.071963
MLE Mean (bias corrected)	12.609538	MLE Sd (bias corrected)	35.862157
95% Percentile of Chisquare (2k)	1.4054327	90% Percentile	36.009319
95% Percentile	71.672686	99% Percentile	179.72877
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	28.945687	16.472569	95% Approx. Gamma UPL	18.809489	9.8247192
95% Gamma USL	87.217178	63.713485			

The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.4784422		nu hat (KM)	62.197489	
WH	HW		WH	HW	
95% Approx. Gamma UTL with 95% Coverage	106.96476	100.50246	95% Approx. Gamma UPL	92.850625	87.371645
95% Gamma USL	163.94173	154.89155			

Background Statistics for Soil Data Sets with Non-Detects			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9916538	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2086257	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	13.069747	Mean in Log Scale	-2.549263
SD in Original Scale	71.221996	SD in Log Scale	2.8944835
95% UTL95% Coverage	25.531243	95% BCA UTL95% Coverage	169.80000
95% Bootstrap (%) UTL95% Coverage	190.00000	95% UPL (t)	10.162320
90% Percentile (z)	3.1904653	95% Percentile (z)	9.1315787
99% Percentile (z)	65.648347	95% USL	543.66689
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	3.6101782	95% KM UTL (Lognormal)95% Coverage	84.420616
KM SD of Logged Data	0.4128025	95% KM UPL (Lognormal)	74.027049
95% KM Percentile Lognormal (z)	72.906510	95% KM USL (Lognormal)	130.58133
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	36.000000	Mean in Log Scale	3.2465774
SD in Original Scale	67.703974	SD in Log Scale	0.5832452
95% UTL95% Coverage	82.525538	95% UPL (t)	68.544323
90% Percentile (z)	54.273502	95% Percentile (z)	67.082975
99% Percentile (z)	99.823987	95% USL	152.83965
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	190.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	89.000000	95% USL	540.00000
95% KM Chebyshev UPL	330.97853		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
BENZO(K)FLUORANTHENE			
General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	23.000000		
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	21.000000

Background Statistics for Soil Data Sets with Non-Detects			
Minimum Detect	66.000000	Minimum Non-Detect	42.000000
Maximum Detect	520.00000	Maximum Non-Detect	81.000000
Variance Detected	56572.000	Percent Non-Detects	95.384615%
Mean Detected	252.00000	SD Detected	237.84869
Mean of Detected Logged Data	5.1930940	SD of Detected Logged Data	1.0332791

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9108395	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3015281	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	51.761974	SD	60.683090
95% UTL95% Coverage	173.13233	95% KM UPL (t)	153.81895
90% KM Percentile (z)	129.53048	95% KM Percentile (z)	151.57677
99% KM Percentile (z)	192.93195	95% KM USL	237.25265

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	37.200000	SD	63.728538
95% UTL95% Coverage	164.66146	95% UPL (t)	144.37882
90% Percentile (z)	118.87141	95% Percentile (z)	142.02412
99% Percentile (z)	185.45475	95% USL	231.99973

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.6333787	k star (bias corrected MLE)	N/A
Theta hat (MLE)	154.28143	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.8002720	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	11.640308
Maximum	520.00000	Median	0.0100000

Background Statistics for Soil Data Sets with Non-Detects			
SD	67.874967	CV	5.8310286
k hat (MLE)	0.1200177	k star (bias corrected MLE)	0.1247349
Theta hat (MLE)	96.988227	Theta star (bias corrected MLE)	93.320399
nu hat (MLE)	15.602306	nu star (bias corrected)	16.215533
MLE Mean (bias corrected)	11.640308	MLE Sd (bias corrected)	32.958734
95% Percentile of Chisquare (2k)	1.4162471	90% Percentile	33.316087
95% Percentile	66.082371	99% Percentile	165.14723

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	26.308236	14.901532	95% Approx. Gamma UPL	17.108273	8.9080925
95% Gamma USL	79.153473	57.362633			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)	0.7275893		nu hat (KM)		94.586605
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	112.00171	106.19568	95% Approx. Gamma UPL	98.884811	93.957236
95% Gamma USL	163.77126	155.53106			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9976748	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1887768	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	12.132804	Mean in Log Scale	-2.143001
SD in Original Scale	67.801099	SD in Log Scale	2.6650362
95% UTL95% Coverage	24.221828	95% BCA UTL95% Coverage	149.20000
95% Bootstrap (%) UTL95% Coverage	149.20000	95% UPL (t)	10.371517
90% Percentile (z)	3.5693371	95% Percentile (z)	9.3989035
99% Percentile (z)	57.789082	95% USL	404.73977

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	3.8061551	95% KM UTL (Lognormal)95% Coverage	91.612902
KM SD of Logged Data	0.3556963	95% KM UPL (Lognormal)	81.807261
95% KM Percentile Lognormal (z)	80.739135	95% KM USL (Lognormal)	133.40850

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	37.200000	Mean in Log Scale	3.3602666
SD in Original Scale	63.728538	SD in Log Scale	0.4795901
95% UTL95% Coverage	75.149518	95% UPL (t)	64.511429
90% Percentile (z)	53.244046	95% Percentile (z)	63.378333
99% Percentile (z)	87.878918	95% USL	124.74041

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	170.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	79.500000	95% USL	520.00000
95% KM Chebyshev UPL	318.30037		

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

BERYLLIUM

General Statistics			
Total Number of Observations	63.000000	Number of Missing Observations	3.0000000
Number of Distinct Observations	43.000000		
Number of Detects	39.000000	Number of Non-Detects	24.000000
Number of Distinct Detects	27.000000	Number of Distinct Non-Detects	18.000000
Minimum Detect	60.000000	Minimum Non-Detect	10.000000
Maximum Detect	190.00000	Maximum Non-Detect	92.300000
Variance Detected	1170.1043	Percent Non-Detects	38.095238%
Mean Detected	117.42051	SD Detected	34.206787
Mean of Detected Logged Data	4.7252262	SD of Detected Logged Data	0.2882158

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0065013	d2max (for USL)	3.0451154

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9336389	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9390000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1411554	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1418735	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	84.365885	SD	53.257865
95% UTL95% Coverage	191.22786	95% KM UPL (t)	173.99910
90% KM Percentile (z)	152.61859	95% KM Percentile (z)	171.96728
99% KM Percentile (z)	208.26221	95% KM USL	246.54223

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	85.302381	SD	50.241759
95% UTL95% Coverage	186.11254	95% UPL (t)	169.85948
90% Percentile (z)	149.68979	95% Percentile (z)	167.94272
99% Percentile (z)	202.18219	95% USL	238.29434

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.5420040	**Anderson-Darling GOF Test**

Background Statistics for Soil Data Sets with Non-Detects			
5% A-D Critical Value	0.7477406	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1057173	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1411700	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	12.499271	k star (bias corrected MLE)	11.554883
Theta hat (MLE)	9.3941887	Theta star (bias corrected MLE)	10.161982
nu hat (MLE)	974.94316	nu star (bias corrected)	901.28087
MLE Mean (bias corrected)	117.42051		
MLE Sd (bias corrected)	34.543091	95% Percentile of Chisquare (2k)	35.309113
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	21.539714	Mean	93.133034
Maximum	190.00000	Median	84.800000
SD	41.642056	CV	0.4471244
k hat (MLE)	5.0888861	k star (bias corrected MLE)	4.8571402
Theta hat (MLE)	18.301261	Theta star (bias corrected MLE)	19.174459
nu hat (MLE)	641.19965	nu star (bias corrected)	611.99967
MLE Mean (bias corrected)	93.133034	MLE Sd (bias corrected)	42.258437
95% Percentile of Chisquare (2k)	17.912620	90% Percentile	149.71848
95% Percentile	171.73239	99% Percentile	218.31381
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	193.93213	197.75657	95% Approx. Gamma UPL	172.79393	174.96285
95% Gamma USL	273.31113	286.18622			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	2.5093788	nu hat (KM)	316.18173		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	275.27054	303.02864	95% Approx. Gamma UPL	228.46079	245.31373
95% Gamma USL	467.86569	558.55976			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.9651926	**Shapiro Wilk GOF Test**			
5% Shapiro Wilk Critical Value	0.9390000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.0953871	**Lilliefors GOF Test**			
5% Lilliefors Critical Value	0.1418735	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	96.122614	Mean in Log Scale	4.4915509		
SD in Original Scale	38.542385	SD in Log Scale	0.3836654		
95% UTL95% Coverage	192.74652	95% BCA UTL95% Coverage	180.00000		

Background Statistics for Soil Data Sets with Non-Detects			
95% Bootstrap (%) UTL95% Coverage	180.00000	95% UPL (t)	170.24888
90% Percentile (z)	145.94617	95% Percentile (z)	167.77508
99% Percentile (z)	217.91172	95% USL	287.10737

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	4.0464070	95% KM UTL (Lognormal)95% Coverage	483.82040
KM SD of Logged Data	1.0641941	95% KM UPL (Lognormal)	342.90388
95% KM Percentile Lognormal (z)	329.26089	95% KM USL (Lognormal)	1461.1817

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	85.302381	Mean in Log Scale	4.1490835
SD in Original Scale	50.241759	SD in Log Scale	0.9652781
95% UTL95% Coverage	439.62206	95% UPL (t)	321.71010
90% Percentile (z)	218.35829	95% Percentile (z)	310.07828
99% Percentile (z)	598.63752	95% USL	1198.0696

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	62.000000	95% UTL with95% Coverage	180.00000
Approximate f	1.6315789	Confidence Coefficient (CC) achieved by UTL	0.8295302
95% UPL	179.80000	95% USL	190.00000
95% KM Chebyshev UPL	318.34671		

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

CADMIUM

General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	41.000000		
Number of Detects	5.0000000	Number of Non-Detects	61.000000
Number of Distinct Detects	5.0000000	Number of Distinct Non-Detects	36.000000
Minimum Detect	66.500000	Minimum Non-Detect	10.000000
Maximum Detect	320.00000	Maximum Non-Detect	73.500000
Variance Detected	12756.423	Percent Non-Detects	92.424242%
Mean Detected	161.64000	SD Detected	112.94434
Mean of Detected Logged Data	4.8838266	SD of Detected Logged Data	0.7101613

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8567709	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Normal at 5% Significance Level	

Background Statistics for Soil Data Sets with Non-Detects			
Lilliefors Test Statistic	0.2762422	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	21.729793	SD	48.900890
95% UTL95% Coverage	119.38361	95% KM UPL (t)	103.94342
90% KM Percentile (z)	84.398805	95% KM Percentile (z)	102.16460
99% KM Percentile (z)	135.49027	95% KM USL	171.48138
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	34.190909	SD	47.834127
95% UTL95% Coverage	129.71442	95% UPL (t)	114.61106
90% Percentile (z)	95.492809	95% Percentile (z)	112.87105
99% Percentile (z)	145.46973	95% USL	180.67570
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4207286	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.6832932	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2460244	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.3598026	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.6355927	k star (bias corrected MLE)	1.1875704
Theta hat (MLE)	61.329658	Theta star (bias corrected MLE)	136.10982
nu hat (MLE)	26.355927	nu star (bias corrected)	11.875704
MLE Mean (bias corrected)	161.64000		
MLE Sd (bias corrected)	148.32664	95% Percentile of Chisquare (2k)	6.6995748
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	12.254697
Maximum	320.00000	Median	0.0100000
SD	51.403595	CV	4.1946035
k hat (MLE)	0.1235682	k star (bias corrected MLE)	0.1280525
Theta hat (MLE)	99.173538	Theta star (bias corrected MLE)	95.700577
nu hat (MLE)	16.311004	nu star (bias corrected)	16.902928
MLE Mean (bias corrected)	12.254697	MLE Sd (bias corrected)	34.245899
95% Percentile of Chisquare (2k)	1.4484372	90% Percentile	35.296735
95% Percentile	69.308138	99% Percentile	171.49665
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	36.764069	25.201441	95% Approx. Gamma UPL	24.219776	15.173134
95% Gamma USL	109.36949	97.357146			

Background Statistics for Soil Data Sets with Non-Detects					
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.1974593		nu hat (KM)	26.064632	
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	70.751344	65.302909	95% Approx. Gamma UPL	57.537428	52.749457
95% Gamma USL	129.96093	124.62845			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.8843794	Shapiro Wilk GOF Test			
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.2053372	Lilliefors GOF Test			
5% Lilliefors Critical Value	0.3962312	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	15.212629		Mean in Log Scale	0.9755242	
SD in Original Scale	50.881126		SD in Log Scale	1.5090026	
95% UTL95% Coverage	53.998886		95% BCA UTL95% Coverage	207.50000	
95% Bootstrap (%) UTL95% Coverage	207.50000		95% UPL (t)	33.532130	
90% Percentile (z)	18.345583		95% Percentile (z)	31.741108	
99% Percentile (z)	88.764713		95% USL	269.51303	
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution					
KM Mean of Logged Data	2.5062216		95% KM UTL (Lognormal)95% Coverage	50.970605	
KM SD of Logged Data	0.7135934		95% KM UPL (Lognormal)	40.688109	
95% KM Percentile Lognormal (z)	39.645531		95% KM USL (Lognormal)	109.01587	
Background DL/2 Statistics Assuming Lognormal Distribution					
Mean in Original Scale	34.190909		Mean in Log Scale	3.0422484	
SD in Original Scale	47.834127		SD in Log Scale	1.0064064	
95% UTL95% Coverage	156.33734		95% UPL (t)	113.77795	
90% Percentile (z)	76.097102		95% Percentile (z)	109.68797	
99% Percentile (z)	217.78317		95% USL	456.78652	
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.					
Nonparametric Distribution Free Background Statistics					
Data appear to follow a Discernible Distribution at 5% Significance Level					
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)					
Order of Statistic, r	65.000000		95% UTL with95% Coverage	240.00000	
Approximate f	1.7105263		Confidence Coefficient (CC) achieved by UTL	0.8484963	
95% UPL	97.225000		95% USL	320.00000	
95% KM Chebyshev UPL	236.49256				

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.

The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

	Background Statistics for Soil Data Sets with Non-Detects		
CALCIUM			
General Statistics			
Total Number of Observations	62.000000	Number of Missing Observations	4.0000000
Number of Distinct Observations	53.000000		
Number of Detects	35.000000	Number of Non-Detects	27.000000
Number of Distinct Detects	34.000000	Number of Distinct Non-Detects	19.000000
Minimum Detect	39900.000	Minimum Non-Detect	970.00000
Maximum Detect	1390000.0	Maximum Non-Detect	15100.000
Variance Detected	1.148E+11	Percent Non-Detects	43.548387%
Mean Detected	488160.00	SD Detected	338786.21
Mean of Detected Logged Data	12.835402	SD of Detected Logged Data	0.8062397
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0098464	d2max (for USL)	3.0391500
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8914575	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.9340000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1995610	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1497613	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	275996.61	SD	348270.45
95% UTL95% Coverage	975966.73	95% KM UPL (t)	862356.93
90% KM Percentile (z)	722323.16	95% KM Percentile (z)	848850.53
99% KM Percentile (z)	1086194.8	95% KM USL	1334442.8
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	278247.66	SD	349328.04
95% UTL95% Coverage	980343.36	95% UPL (t)	866388.57
90% Percentile (z)	725929.56	95% Percentile (z)	852841.15
99% Percentile (z)	1090906.2	95% USL	1339908.0
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.2984929	Anderson-Darling GOF Test	
5% A-D Critical Value	0.7594034	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1101947	Kolmogrov-Smirnoff GOF	
5% K-S Critical Value	0.1506072	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.0522398	k star (bias corrected MLE)	1.8953812
Theta hat (MLE)	237866.94	Theta star (bias corrected MLE)	257552.42
nu hat (MLE)	143.65679	nu star (bias corrected)	132.67668
MLE Mean (bias corrected)	488160.00		
MLE Sd (bias corrected)	354579.73	95% Percentile of Chisquare (2k)	9.1464598

Background Statistics for Soil Data Sets with Non-Detects			
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	275574.20
Maximum	1390000.0	Median	158500.00
SD	351450.00	CV	1.2753371
k hat (MLE)	0.1100915	k star (bias corrected MLE)	0.1155171
Theta hat (MLE)	2503138.8	Theta star (bias corrected MLE)	2385569.8
nu hat (MLE)	13.651341	nu star (bias corrected)	14.324125
MLE Mean (bias corrected)	275574.20	MLE Sd (bias corrected)	810802.98
95% Percentile of Chisquare (2k)	1.3244002	90% Percentile	772232.07
95% Percentile	1579724.6	99% Percentile	4068311.5

The following statistics are computed using Gamma ROS Statistics on Imputed Data					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1807705.0	2662831.2	95% Approx. Gamma UPL	1291126.5	1712016.8
95% Gamma USL	4299429.5	8329286.3			

The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)		0.6280211	nu hat (KM)		77.874617
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1578035.0	1974035.3	95% Approx. Gamma UPL	1159479.9	1352886.7
95% Gamma USL	3531914.3	5372375.2			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9470086	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9340000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1295324	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1497613	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	302405.72	Mean in Log Scale	12.035447
SD in Original Scale	330956.77	SD in Log Scale	1.1103619
95% UTL95% Coverage	1570812.5	95% BCA UTL95% Coverage	1290000.0
95% Bootstrap (%) UTL95% Coverage	1290000.0	95% UPL (t)	1093496.4
90% Percentile (z)	699718.02	95% Percentile (z)	1047408.4
99% Percentile (z)	2232281.5	95% USL	4925828.4

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	10.240743	95% KM UTL (Lognormal)95% Coverage	11973133
KM SD of Logged Data	3.0138784	95% KM UPL (Lognormal)	4479465.1
95% KM Percentile Lognormal (z)	3985334.9	95% KM USL (Lognormal)	2.6636E+8

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	278247.66	Mean in Log Scale	10.993743
SD in Original Scale	349328.04	SD in Log Scale	2.2406868

Background Statistics for Soil Data Sets with Non-Detects			
95% UTL95% Coverage	5374518.5	95% UPL (t)	2587601.4
90% Percentile (z)	1051048.6	95% Percentile (z)	2372239.6
99% Percentile (z)	10922771	95% USL	53947744

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	61.000000	95% UTL with95% Coverage	1290000.0
Approximate f	1.6052632	Confidence Coefficient (CC) achieved by UTL	0.8227464
95% UPL	1078500.0	95% USL	1390000.0
95% KM Chebyshev UPL	1806265.9		

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

CARBON DISULFIDE

General Statistics

Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	30.000000		
Number of Detects	27.000000	Number of Non-Detects	38.000000
Number of Distinct Detects	25.000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	2.0000000	Minimum Non-Detect	2.0000000
Maximum Detect	100.00000	Maximum Non-Detect	3.2000000
Variance Detected	1265.9633	Percent Non-Detects	58.461538%
Mean Detected	32.344444	SD Detected	35.580378
Mean of Detected Logged Data	2.6823155	SD of Detected Logged Data	1.3704705

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.7691158	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9230000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.3088599	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1705108	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	14.607107	SD	27.017178
95% UTL95% Coverage	68.643321	95% KM UPL (t)	60.044666
90% KM Percentile (z)	49.231014	95% KM Percentile (z)	59.046410
99% KM Percentile (z)	77.458461	95% KM USL	97.190815

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	14.076923	SD	27.479528

Background Statistics for Soil Data Sets with Non-Detects			
95% UTL95% Coverage	69.037869	95% UPL (t)	60.292064
90% Percentile (z)	49.293355	95% Percentile (z)	59.276724
99% Percentile (z)	78.003865	95% USL	98.073902

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.6345843	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7837862	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2222876	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.1749434	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.7533693	k star (bias corrected MLE)	0.6943530
Theta hat (MLE)	42.933053	Theta star (bias corrected MLE)	46.582136
nu hat (MLE)	40.681942	nu star (bias corrected)	37.495060
MLE Mean (bias corrected)	32.344444		
MLE Sd (bias corrected)	38.815890	95% Percentile of Chisquare (2k)	4.7406300

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	13.441231
Maximum	100.00000	Median	0.0100000
SD	27.787733	CV	2.0673504
k hat (MLE)	0.1792165	k star (bias corrected MLE)	0.1812014
Theta hat (MLE)	74.999969	Theta star (bias corrected MLE)	74.178419
nu hat (MLE)	23.298143	nu star (bias corrected)	23.556178
MLE Mean (bias corrected)	13.441231	MLE Sd (bias corrected)	31.576087
95% Percentile of Chisquare (2k)	1.9140802	90% Percentile	40.549321
95% Percentile	70.991720	99% Percentile	156.21641

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	72.835648	81.985895	95% Approx. Gamma UPL	51.081210	52.867311
95% Gamma USL	187.41099	268.23257			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)		0.2923132	nu hat (KM)		38.000720
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	62.499862	62.035333	95% Approx. Gamma UPL	47.950406	46.217501
95% Gamma USL	131.28190	144.56334			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.8806381	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9230000	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1816299	**Lilliefors GOF Test**

Background Statistics for Soil Data Sets with Non-Detects			
5% Lilliefors Critical Value	0.1705108	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	13.761754	Mean in Log Scale	0.4445427
SD in Original Scale	27.634094	SD in Log Scale	2.3013366
95% UTL95% Coverage	155.61329	95% BCA UTL95% Coverage	97.800000
95% Bootstrap (%) UTL95% Coverage	100.00000	95% UPL (t)	74.808869
90% Percentile (z)	29.779617	95% Percentile (z)	68.710668
99% Percentile (z)	329.72273	95% USL	1770.5822
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	14.076923	Mean in Log Scale	1.1621599
SD in Original Scale	27.479528	SD in Log Scale	1.5628981
95% UTL95% Coverage	72.825310	95% UPL (t)	44.284997
90% Percentile (z)	23.690981	95% Percentile (z)	41.800091
99% Percentile (z)	121.26819	95% USL	379.74040
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	100.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	86.300000	95% USL	100.00000
95% KM Chebyshev UPL	133.27468		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
CHROMIUM			
General Statistics			
Total Number of Observations	62.000000	Number of Distinct Observations	52.000000
		Number of Missing Observations	4.0000000
Minimum	484.00000	First Quartile	2740.0000
Second Largest	7500.0000	Median	3685.0000
Maximum	8030.0000	Third Quartile	4787.5000
Mean	4037.4839	SD	1645.1087
Coefficient of Variation	0.4074589	Skewness	0.6610595
Mean of logged Data	8.2130744	SD of logged Data	0.4592735
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0098464	d2max (for USL)	3.0391500
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9425083	Normal GOF Test	

Background Statistics for Soil Data Sets with Non-Detects			
5% Shapiro Wilk P Value	0.0102689	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1131346	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1125221	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	7343.8997	90% Percentile (z)	6145.7755
95% UPL (t)	6807.2465	95% Percentile (z)	6743.4469
95% USL	9037.2160	99% Percentile (z)	7864.5790
Gamma GOF Test			
A-D Test Statistic	0.4213643	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7531706	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0769187	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1133062	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	5.6983959	k star (bias corrected MLE)	5.4334198
Theta hat (MLE)	708.52990	Theta star (bias corrected MLE)	743.08337
nu hat (MLE)	706.60109	nu star (bias corrected)	673.74405
MLE Mean (bias corrected)	4037.4839	MLE Sd (bias corrected)	1732.1048
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	7274.6177	90% Percentile	6354.9759
95% Hawkins Wixley (HW) Approx. Gamma UPL	7400.5182	95% Percentile	7242.8357
95% WH Approx. Gamma UTL with 95% Coverage	8125.3704	99% Percentile	9111.9035
95% HW Approx. Gamma UTL with 95% Coverage	8327.3479		
95% WH USL	11239.378	95% HW USL	11829.048
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9245434	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	8.6004E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0866310	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1125221	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	9284.8904	90% Percentile (z)	6645.2469
95% UPL (t)	7993.0157	95% Percentile (z)	7851.9104
95% USL	14896.410	99% Percentile (z)	10737.573
Nonparametric Distribution Free Background Statistics			
Data appear Gamma Distributed at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	61.000000	95% UTL with 95% Coverage	7500.0000
Approximate f	1.6052632	Confidence Coefficient (CC) achieved by UTL	0.8227464
95% Percentile Bootstrap UTL with 95% Coverage	7500.0000	95% BCA Bootstrap UTL with 95% Coverage	7495.0000
95% UPL	7400.0000	90% Percentile	6580.0000

Background Statistics for Soil Data Sets with Non-Detects			
90% Chebyshev UPL	9012.4518	95% Percentile	7390.0000
95% Chebyshev UPL	11265.945	99% Percentile	7706.7000
95% USL	8030.0000		

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

CHRYSENE

General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	24.000000		
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	180.00000	Minimum Non-Detect	36.000000
Maximum Detect	2500.0000	Maximum Non-Detect	91.000000
Variance Detected	1548400.0	Percent Non-Detects	95.454545%
Mean Detected	1080.0000	SD Detected	1244.3472
Mean of Detected Logged Data	6.4483132	SD of Detected Logged Data	1.3196687

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8690094	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3286528	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	83.454545	SD	306.93945
95% UTL95% Coverage	696.40469	95% KM UPL (t)	599.49023
90% KM Percentile (z)	476.81327	95% KM Percentile (z)	588.32501
99% KM Percentile (z)	797.50247	95% KM USL	1023.4102

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	73.704545	SD	310.93108
95% UTL95% Coverage	694.62588	95% UPL (t)	596.45109
90% Percentile (z)	472.17876	95% Percentile (z)	585.14067
99% Percentile (z)	797.03841	95% USL	1025.8840

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Background Statistics for Soil Data Sets with Non-Detects			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.0679706	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1011.2638	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	6.4078236	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	49.100455
Maximum	2500.0000	Median	0.0100000
SD	314.68870	CV	6.4090792
k hat (MLE)	0.1013819	k star (bias corrected MLE)	0.1068747
Theta hat (MLE)	484.31176	Theta star (bias corrected MLE)	459.42093
nu hat (MLE)	13.382413	nu star (bias corrected)	14.107455
MLE Mean (bias corrected)	49.100455	MLE Sd (bias corrected)	150.19246
95% Percentile of Chisquare (2k)	1.2347970	90% Percentile	134.09485
95% Percentile	283.64579	99% Percentile	754.25360
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH		WH	HW
95% Approx. Gamma UTL with 95% Coverage	99.038847	51.029540	95% Approx. Gamma UPL	63.685738	29.738836
95% Gamma USL	309.36656	211.04829			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.0739256	nu hat (KM)	9.7581730		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	259.48092	223.52907	95% Approx. Gamma UPL	208.94028	179.90037
95% Gamma USL	488.84859	430.85551			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.9937405	Shapiro Wilk GOF Test			
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.2030066	Lilliefors GOF Test			
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	49.282045	Mean in Log Scale	-5.113944		
SD in Original Scale	314.66084	SD in Log Scale	4.2263360		
95% UTL95% Coverage	27.825141	95% BCA UTL95% Coverage	465.00000		
95% Bootstrap (%) UTL95% Coverage	560.00000	95% UPL (t)	7.3264965		
90% Percentile (z)	1.3529991	95% Percentile (z)	6.2824516		
99% Percentile (z)	111.94235	95% USL	2511.3402		

Background Statistics for Soil Data Sets with Non-Detects			
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	3.7137369	95% KM UTL (Lognormal)95% Coverage	147.03227
KM SD of Logged Data	0.6394250	95% KM UPL (Lognormal)	120.15194
95% KM Percentile Lognormal (z)	117.38949	95% KM USL (Lognormal)	290.58013
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	73.704545	Mean in Log Scale	3.3473764
SD in Original Scale	310.93108	SD in Log Scale	0.7807041
95% UTL95% Coverage	135.15501	95% UPL (t)	105.62755
90% Percentile (z)	77.315076	95% Percentile (z)	102.67004
99% Percentile (z)	174.78658	95% USL	310.49405
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	560.00000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	148.85000	95% USL	2500.0000
95% KM Chebyshev UPL	1431.4702		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations. The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.			

COBALT

General Statistics			
Total Number of Observations	61.000000	Number of Missing Observations	5.0000000
Number of Distinct Observations	46.000000		
Number of Detects	52.000000	Number of Non-Detects	9.0000000
Number of Distinct Detects	40.000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	129.00000	Minimum Non-Detect	10.000000
Maximum Detect	620.00000	Maximum Non-Detect	138.00000
Variance Detected	16009.998	Percent Non-Detects	14.754098%
Mean Detected	299.03846	SD Detected	126.53062
Mean of Detected Logged Data	5.6150028	SD of Detected Logged Data	0.4193901
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0132825	d2max (for USL)	3.0330674
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9228671	**Normal GOF Test on Detected Observations Only**	
5% Shapiro Wilk P Value	0.0024575	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1559551	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1228661	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			

Background Statistics for Soil Data Sets with Non-Detects			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	260.67131	SD	149.26421
95% UTL95% Coverage	561.18233	95% KM UPL (t)	512.07507
90% KM Percentile (z)	451.96109	95% KM Percentile (z)	506.18909
99% KM Percentile (z)	607.91179	95% KM USL	713.39973
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	263.57377	SD	145.09149
95% UTL95% Coverage	555.68392	95% UPL (t)	507.94946
90% Percentile (z)	449.51600	95% Percentile (z)	502.22803
99% Percentile (z)	601.10705	95% USL	703.64604
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.3407339	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7528579	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1050108	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1233888	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	6.0049451	k star (bias corrected MLE)	5.6713265
Theta hat (MLE)	49.798700	Theta star (bias corrected MLE)	52.728134
nu hat (MLE)	624.51429	nu star (bias corrected)	589.81796
MLE Mean (bias corrected)	299.03846		
MLE Sd (bias corrected)	125.56966	95% Percentile of Chisquare (2k)	20.139851
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	52.092459	Mean	267.19730
Maximum	620.00000	Median	260.00000
SD	140.01226	CV	0.5240033
k hat (MLE)	3.4423675	k star (bias corrected MLE)	3.2839997
Theta hat (MLE)	77.620213	Theta star (bias corrected MLE)	81.363375
nu hat (MLE)	419.96883	nu star (bias corrected)	400.64796
MLE Mean (bias corrected)	267.19730	MLE Sd (bias corrected)	147.44516
95% Percentile of Chisquare (2k)	13.434540	90% Percentile	464.90925
95% Percentile	546.53976	99% Percentile	722.64244
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	632.09411	652.95506	95% Approx. Gamma UPL	551.06935	563.21639
95% Gamma USL	932.89280	1000.1078			

The following statistics are computed using gamma distribution and KM estimates	
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods	

Background Statistics for Soil Data Sets with Non-Detects					
k hat (KM)	3.0498262		nu hat (KM)		372.07880
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	804.15956	902.76972	95% Approx. Gamma UPL	672.81810	735.65622
95% Gamma USL	1317.4993	1604.5853			

Lognormal GOF Test on Detected Observations Only		
Lilliefors Test Statistic	0.0773388	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1228661	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	271.51719	Mean in Log Scale	5.4827182
SD in Original Scale	134.44085	SD in Log Scale	0.5036921
95% UTL95% Coverage	663.01174	95% BCA UTL95% Coverage	590.00000
95% Bootstrap (%) UTL95% Coverage	590.00000	95% UPL (t)	561.76309
90% Percentile (z)	458.62166	95% Percentile (z)	550.71531
99% Percentile (z)	776.25516	95% USL	1108.1534

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	5.2177321	95% KM UTL (Lognormal)95% Coverage	1731.4610
KM SD of Logged Data	1.1121086	95% KM UPL (Lognormal)	1200.9186
95% KM Percentile Lognormal (z)	1149.3915	95% KM USL (Lognormal)	5382.0924

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	263.57377	Mean in Log Scale	5.3610483
SD in Original Scale	145.09149	SD in Log Scale	0.7914583
95% UTL95% Coverage	1047.8308	95% UPL (t)	807.61957
90% Percentile (z)	587.18675	95% Percentile (z)	782.80321
99% Percentile (z)	1342.4554	95% USL	2348.6468

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	60.000000	95% UTL with95% Coverage	590.00000
Approximate f	1.5789474	Confidence Coefficient (CC) achieved by UTL	0.8157208
95% UPL	567.00000	95% USL	620.00000
95% KM Chebyshev UPL	916.61026		

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

COPPER

General Statistics

Total Number of Observations	66.000000	Number of Distinct Observations	58.000000
Minimum	320.00000	First Quartile	1722.5000

Background Statistics for Soil Data Sets with Non-Detects			
Second Largest	4510.0000	Median	2255.0000
Maximum	4850.0000	Third Quartile	2885.0000
Mean	2298.9394	SD	973.67366
Coefficient of Variation	0.4235317	Skewness	0.2227308
Mean of logged Data	7.6276078	SD of logged Data	0.5244052

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test		
Shapiro Wilk Test Statistic	0.9814325	**Normal GOF Test**
5% Shapiro Wilk P Value	0.7106634	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.0671291	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1090591	Data appear Normal at 5% Significance Level
Data appear Normal at 5% Significance Level		

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	4243.3405	90% Percentile (z)	3546.7524
95% UPL (t)	3935.9084	95% Percentile (z)	3900.4900
95% USL	5280.6679	99% Percentile (z)	4564.0430

Gamma GOF Test		
A-D Test Statistic	0.7449734	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7542332	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1032969	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.1100719	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	4.6008022	k star (bias corrected MLE)	4.4017759
Theta hat (MLE)	499.68229	Theta star (bias corrected MLE)	522.27543
nu hat (MLE)	607.30589	nu star (bias corrected)	581.03441
MLE Mean (bias corrected)	2298.9394	MLE Sd (bias corrected)	1095.7553

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	4374.4337	90% Percentile	3767.0434
95% Hawkins Wixley (HW) Approx. Gamma UPL	4481.7506	95% Percentile	4346.2860
95% WH Approx. Gamma UTL with 95% Coverage	4917.2248	99% Percentile	5577.6890
95% HW Approx. Gamma UTL with 95% Coverage	5084.1148		
95% WH USL	7076.6815	95% HW USL	7572.1637

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.9191612	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	2.2990E-4	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1389066	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.1090591	Data Not Lognormal at 5% Significance Level
Data Not Lognormal at 5% Significance Level		

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	5853.7133	90% Percentile (z)	4022.5051

Background Statistics for Soil Data Sets with Non-Detects			
95% UPL (t)	4960.4582	95% Percentile (z)	4866.7306
95% USL	10234.500	99% Percentile (z)	6957.3699

Nonparametric Distribution Free Background Statistics

Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	65.000000	95% UTL with 95% Coverage	4510.0000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% Percentile Bootstrap UTL with 95% Coverage	4510.0000	95% BCA Bootstrap UTL with 95% Coverage	4510.0000
95% UPL	3901.0000	90% Percentile	3565.0000
90% Chebyshev UPL	5242.0061	95% Percentile	3807.5000
95% Chebyshev UPL	6575.1162	99% Percentile	4629.0000
95% USL	4850.0000		

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

ENDOSULFAN SULFATE

General Statistics

Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	32.000000		
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	29.000000
Minimum Detect	2.4200000	Minimum Non-Detect	0.2240000
Maximum Detect	13.600000	Maximum Non-Detect	6.8000000
Variance Detected	35.425300	Percent Non-Detects	95.454545%
Mean Detected	6.8300000	SD Detected	5.9519157
Mean of Detected Logged Data	1.6637419	SD of Detected Logged Data	0.8750914

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8820674	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3208026	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	0.5257978	SD	1.7237817
95% UTL95% Coverage	3.9681454	95% KM UPL (t)	3.4238707

Background Statistics for Soil Data Sets with Non-Detects			
90% KM Percentile (z)	2.7349130	95% KM Percentile (z)	3.3611664
99% KM Percentile (z)	4.5359138	95% KM USL	5.8046190

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.5571667	SD	1.7775737
95% UTL95% Coverage	4.1069354	95% UPL (t)	3.5456762
90% Percentile (z)	2.8352190	95% Percentile (z)	3.4810152
99% Percentile (z)	4.6924214	95% USL	6.0007175

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.0925176	k star (bias corrected MLE)	N/A
Theta hat (MLE)	3.2640108	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	12.555105	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	0.3200000
Maximum	13.600000	Median	0.0100000
SD	1.7717666	CV	5.5367707
k hat (MLE)	0.2268181	k star (bias corrected MLE)	0.2266092
Theta hat (MLE)	1.4108223	Theta star (bias corrected MLE)	1.4121229
nu hat (MLE)	29.939985	nu star (bias corrected)	29.912410
MLE Mean (bias corrected)	0.3200000	MLE Sd (bias corrected)	0.6722197
95% Percentile of Chisquare (2k)	2.2572905	90% Percentile	0.9657489
95% Percentile	1.5937858	99% Percentile	3.2894539

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.9248921	0.6534301	95% Approx. Gamma UPL	0.6486899	0.4427689
95% Gamma USL	2.4110788	1.9410359			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)		0.0930407	nu hat (KM)		12.281374
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.6849837	1.4768589	95% Approx. Gamma UPL	1.3544376	1.1835951
95% Gamma USL	3.1884358	2.8793932			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9728783	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Lilliefors Test Statistic	0.2420507	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	0.3483435	Mean in Log Scale	-3.732193
SD in Original Scale	1.7674857	SD in Log Scale	1.7541731
95% UTL95% Coverage	0.7952057	95% BCA UTL95% Coverage	3.9575000
95% Bootstrap (%) UTL95% Coverage	4.4700000	95% UPL (t)	0.4570214
90% Percentile (z)	0.2266996	95% Percentile (z)	0.4287699
99% Percentile (z)	1.4171164	95% USL	5.1536098
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	-1.351208	95% KM UTL (Lognormal)95% Coverage	1.0025019
KM SD of Logged Data	0.6778787	95% KM UPL (Lognormal)	0.8093387
95% KM Percentile Lognormal (z)	0.7896257	95% KM USL (Lognormal)	2.0640988
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	0.5571667	Mean in Log Scale	-1.515136
SD in Original Scale	1.7775737	SD in Log Scale	0.9458701
95% UTL95% Coverage	1.4531624	95% UPL (t)	1.0779799
90% Percentile (z)	0.7386326	95% Percentile (z)	1.0415207
99% Percentile (z)	1.9843411	95% USL	3.9806630
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	6.8000000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	3.7525000	95% USL	13.600000
95% KM Chebyshev UPL	8.0962968		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
FLUORANTHENE			
General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	26.000000		
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	23.000000
Minimum Detect	84.000000	Minimum Non-Detect	44.000000
Maximum Detect	920.00000	Maximum Non-Detect	98.000000
Variance Detected	194245.33	Percent Non-Detects	95.384615%
Mean Detected	421.33333	SD Detected	440.73272

Background Statistics for Soil Data Sets with Non-Detects			
Mean of Detected Logged Data	5.6052907	SD of Detected Logged Data	1.1974018

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8994844	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3095054	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	61.480162	SD	110.65812
95% UTL95% Coverage	282.80401	95% KM UPL (t)	247.58527
90% KM Percentile (z)	203.29425	95% KM Percentile (z)	243.49657
99% KM Percentile (z)	318.90945	95% KM USL	399.73007

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	47.992308	SD	113.92859
95% UTL95% Coverage	275.85731	95% UPL (t)	239.59770
90% Percentile (z)	193.99766	95% Percentile (z)	235.38815
99% Percentile (z)	313.02983	95% USL	396.23908

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.2822439	k star (bias corrected MLE)	N/A
Theta hat (MLE)	328.59063	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.6934635	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	19.455692
Maximum	920.00000	Median	0.0100000
SD	118.35143	CV	6.0831263
k hat (MLE)	0.1126121	k star (bias corrected MLE)	0.1176710
Theta hat (MLE)	172.76731	Theta star (bias corrected MLE)	165.33968
nu hat (MLE)	14.639575	nu star (bias corrected)	15.297236

Background Statistics for Soil Data Sets with Non-Detects			
MLE Mean (bias corrected)	19.455692	MLE Sd (bias corrected)	56.716822
95% Percentile of Chisquare (2k)	1.3461918	90% Percentile	54.818602
95% Percentile	111.28946	99% Percentile	284.50317

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	42.011564	22.950075	95% Approx. Gamma UPL	27.162881	13.566391
95% Gamma USL	127.85823	90.426507			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)	0.3086764	nu hat (KM)	40.127932

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	154.20995	142.57132	95% Approx. Gamma UPL	132.29533	122.57656
95% Gamma USL	244.06230	226.81577			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9989399	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1815258	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	19.758772	Mean in Log Scale	-3.028424
SD in Original Scale	118.30404	SD in Log Scale	3.0763637
95% UTL95% Coverage	22.748857	95% BCA UTL95% Coverage	209.14552
95% Bootstrap (%) UTL95% Coverage	260.00000	95% UPL (t)	8.5455642
90% Percentile (z)	2.4945158	95% Percentile (z)	7.6273764
99% Percentile (z)	62.070332	95% USL	587.06241

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	3.8692876	95% KM UTL (Lognormal)95% Coverage	114.72187
KM SD of Logged Data	0.4365965	95% KM UPL (Lognormal)	99.838791
95% KM Percentile Lognormal (z)	98.241134	95% KM USL (Lognormal)	181.96914

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	47.992308	Mean in Log Scale	3.4711940
SD in Original Scale	113.92859	SD in Log Scale	0.5700773
95% UTL95% Coverage	100.62370	95% UPL (t)	83.927342
90% Percentile (z)	66.804967	95% Percentile (z)	82.178006
99% Percentile (z)	121.19394	95% USL	183.78298

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	64.000000	95% UTL with95% Coverage	260.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986

Background Statistics for Soil Data Sets with Non-Detects			
95% UPL	95.900000	95% USL	920.00000
95% KM Chebyshev UPL	547.52393		

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

IRON

General Statistics

Total Number of Observations	63.000000	Number of Distinct Observations	60.000000
		Number of Missing Observations	3.0000000
Minimum	98300.000	First Quartile	1180000.0
Second Largest	5020000.0	Median	1960000.0
Maximum	5820000.0	Third Quartile	2995000.0
Mean	2103671.4	SD	1245370.6
Coefficient of Variation	0.5919986	Skewness	0.6331802
Mean of logged Data	14.320530	SD of logged Data	0.8088804

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.0065013	d2max (for USL)	3.0451154

Normal GOF Test

Shapiro Wilk Test Statistic	0.9602728	Normal GOF Test	
5% Shapiro Wilk P Value	0.0964365	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.0818370	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	4602509.1	90% Percentile (z)	3699678.0
95% UPL (t)	4199635.5	95% Percentile (z)	4152123.7
95% USL	5895968.6	99% Percentile (z)	5000836.6

Gamma GOF Test

A-D Test Statistic	0.4611492	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7617531	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0678737	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.1134764	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.2475121	k star (bias corrected MLE)	2.1510698
Theta hat (MLE)	936000.03	Theta star (bias corrected MLE)	977965.22
nu hat (MLE)	283.18653	nu star (bias corrected)	271.03479
MLE Mean (bias corrected)	2103671.4	MLE Sd (bias corrected)	1434335.2

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	4912858.9	90% Percentile	4022285.3

Background Statistics for Soil Data Sets with Non-Detects			
95% Hawkins Wixley (HW) Approx. Gamma UPL	5143809.1	95% Percentile	4877014.2
95% WH Approx. Gamma UTL with 95% Coverage	5753582.1	99% Percentile	6764639.7
95% HW Approx. Gamma UTL with 95% Coverage	6127126.6		
95% WH USL	9089909.2	95% HW USL	10253757

Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9035504	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	3.7269E-5	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1144175	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	8398380.0	90% Percentile (z)	4672251.9
95% UPL (t)	6464776.5	95% Percentile (z)	6268324.5
95% USL	19455960	99% Percentile (z)	10878153

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	62.000000	95% UTL with 95% Coverage	5020000.0
Approximate f	1.6315789	Confidence Coefficient (CC) achieved by UTL	0.8295302
95% Percentile Bootstrap UTL with 95% Coverage	5020000.0	95% BCA Bootstrap UTL with 95% Coverage	4952000.0
95% UPL	4328000.0	90% Percentile	3658000.0
90% Chebyshev UPL	5869318.1	95% Percentile	4246000.0
95% Chebyshev UPL	7575029.2	99% Percentile	5324000.0
95% USL	5820000.0		

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

LEAD

General Statistics

Total Number of Observations	62.000000	Number of Distinct Observations	56.000000
		Number of Missing Observations	4.0000000
Minimum	978.00000	First Quartile	3087.5000
Second Largest	9100.0000	Median	3985.0000
Maximum	9600.0000	Third Quartile	4750.0000
Mean	4189.9677	SD	1973.0514
Coefficient of Variation	0.4708990	Skewness	0.7894297
Mean of logged Data	8.2218950	SD of logged Data	0.5165904

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0098464	d2max (for USL)	3.0391500

Normal GOF Test

Background Statistics for Soil Data Sets with Non-Detects			
Shapiro Wilk Test Statistic	0.9330644	**Normal GOF Test**	
5% Shapiro Wilk P Value	0.0028199	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1596217	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1125221	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	8155.4980	90% Percentile (z)	6718.5349
95% UPL (t)	7511.8661	95% Percentile (z)	7435.3485
95% USL	10186.367	99% Percentile (z)	8779.9717
Gamma GOF Test			
A-D Test Statistic	0.6825798	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7537965	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1023714	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1134143	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	4.3772754	k star (bias corrected MLE)	4.1762245
Theta hat (MLE)	957.20907	Theta star (bias corrected MLE)	1003.2908
nu hat (MLE)	542.78215	nu star (bias corrected)	517.85183
MLE Mean (bias corrected)	4189.9677	MLE Sd (bias corrected)	2050.3064
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	8083.1314	90% Percentile	6937.6914
95% Hawkins Wixley (HW) Approx. Gamma UPL	8230.8574	95% Percentile	8030.2500
95% WH Approx. Gamma UTL with 95% Coverage	9145.5283	99% Percentile	10358.823
95% HW Approx. Gamma UTL with 95% Coverage	9394.0640		
95% WH USL	13099.685	95% HW USL	13882.825
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9423910	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.0101076	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1269719	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1125221	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	10510.839	90% Percentile (z)	7215.1061
95% UPL (t)	8880.7795	95% Percentile (z)	8704.6316
95% USL	17888.094	99% Percentile (z)	12377.851
Nonparametric Distribution Free Background Statistics			
Data appear Gamma Distributed at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	61.000000	95% UTL with 95% Coverage	9100.0000
Approximate f	1.6052632	Confidence Coefficient (CC) achieved by UTL	0.8227464
95% Percentile Bootstrap UTL with 95% Coverage	9100.0000	95% BCA Bootstrap UTL with 95% Coverage	9075.0000

Background Statistics for Soil Data Sets with Non-Detects			
95% UPL	8555.0000	90% Percentile	6963.0000
90% Chebyshev UPL	10156.666	95% Percentile	8261.0000
95% Chebyshev UPL	12859.380	99% Percentile	9295.0000
95% USL	9600.0000		

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

MAGNESIUM

General Statistics

Total Number of Observations	63.000000	Number of Distinct Observations	58.000000
		Number of Missing Observations	3.0000000
Minimum	6460.0000	First Quartile	77450.000
Second Largest	348000.00	Median	136000.00
Maximum	357000.00	Third Quartile	175000.00
Mean	138293.02	SD	77849.031
Coefficient of Variation	0.5629281	Skewness	1.0552742
Mean of logged Data	11.663627	SD of logged Data	0.6557876

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.0065013	d2max (for USL)	3.0451154

Normal GOF Test

Shapiro Wilk Test Statistic	0.9070495	**Normal GOF Test**	
5% Shapiro Wilk P Value	6.1623E-5	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1011682	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level	

Data appear Approximate Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	294497.20	90% Percentile (z)	238060.56
95% UPL (t)	269313.27	95% Percentile (z)	266343.28
95% USL	375352.30	99% Percentile (z)	319396.94

Gamma GOF Test

A-D Test Statistic	0.4720732	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7577212	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0729509	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1130300	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	3.0382411	k star (bias corrected MLE)	2.9041450
Theta hat (MLE)	45517.459	Theta star (bias corrected MLE)	47619.184
nu hat (MLE)	382.81838	nu star (bias corrected)	365.92227
MLE Mean (bias corrected)	138293.02	MLE Sd (bias corrected)	81150.481

Background Statistics for Soil Data Sets with Non-Detects			
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	294162.90	90% Percentile	247089.93
95% Hawkins Wixley (HW) Approx. Gamma UPL	302665.57	95% Percentile	292950.77
95% WH Approx. Gamma UTL with 95% Coverage	338652.71	99% Percentile	392534.95
95% HW Approx. Gamma UTL with 95% Coverage	352717.93		
95% WH USL	511354.80	95% HW USL	556033.77
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9216999	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	5.0517E-4	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1043502	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1116255	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	433421.28	90% Percentile (z)	269426.90
95% UPL (t)	350571.56	95% Percentile (z)	341909.51
95% USL	856471.03	99% Percentile (z)	534569.42
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	62.000000	95% UTL with 95% Coverage	348000.00
Approximate f	1.6315789	Confidence Coefficient (CC) achieved by UTL	0.8295302
95% Percentile Bootstrap UTL with 95% Coverage	345200.00	95% BCA Bootstrap UTL with 95% Coverage	345200.00
95% UPL	317600.00	90% Percentile	215200.00
90% Chebyshev UPL	373686.36	95% Percentile	307600.00
95% Chebyshev UPL	480311.62	99% Percentile	351420.00
95% USL	357000.00		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
MANGANESE			
General Statistics			
Total Number of Observations	61.000000	Number of Distinct Observations	56.000000
		Number of Missing Observations	5.0000000
Minimum	1900.0000	First Quartile	5490.0000
Second Largest	34000.000	Median	9400.0000
Maximum	35700.000	Third Quartile	15100.000
Mean	11609.672	SD	8115.8618
Coefficient of Variation	0.6990604	Skewness	1.0927685
Mean of logged Data	9.1120364	SD of logged Data	0.7339430
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0132825	d2max (for USL)	3.0330674

Background Statistics for Soil Data Sets with Non-Detects			
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8889127	**Normal GOF Test**	
5% Shapiro Wilk P Value	7.1999E-6	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1319888	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1134407	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	27949.194	90% Percentile (z)	22010.568
95% UPL (t)	25279.112	95% Percentile (z)	24959.077
95% USL	36225.628	99% Percentile (z)	30489.990
Gamma GOF Test			
A-D Test Statistic	0.4119546	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7620798	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0874700	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.1151926	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.1717261	k star (bias corrected MLE)	2.0758489
Theta hat (MLE)	5345.8269	Theta star (bias corrected MLE)	5592.7347
nu hat (MLE)	264.95059	nu star (bias corrected)	253.25357
MLE Mean (bias corrected)	11609.672	MLE Sd (bias corrected)	8057.9039
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	27422.416	90% Percentile	22382.978
95% Hawkins Wixley (HW) Approx. Gamma UPL	28072.153	95% Percentile	27216.257
95% WH Approx. Gamma UTL with 95% Coverage	32320.379	99% Percentile	37912.721
95% HW Approx. Gamma UTL with 95% Coverage	33561.098		
95% WH USL	51134.365	95% HW USL	55763.995
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9675311	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk P Value	0.2324896	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0907612	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.1134407	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	39722.415	90% Percentile (z)	23216.585
95% UPL (t)	31201.047	95% Percentile (z)	30310.976
95% USL	83963.286	99% Percentile (z)	49983.242
Nonparametric Distribution Free Background Statistics			
Data appear Gamma Distributed at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	60.000000	95% UTL with 95% Coverage	34000.000

Background Statistics for Soil Data Sets with Non-Detects			
Approximate f	1.5789474	Confidence Coefficient (CC) achieved by UTL	0.8157208
95% Percentile Bootstrap UTL with 95% Coverage	34000.000	95% BCA Bootstrap UTL with 95% Coverage	34000.000
95% UPL	28960.000	90% Percentile	23100.000
90% Chebyshev UPL	36156.017	95% Percentile	25900.000
95% Chebyshev UPL	47274.684	99% Percentile	34680.000
95% USL	35700.000		

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

MERCURY

General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	37.000000		
Number of Detects	37.000000	Number of Non-Detects	28.000000
Number of Distinct Detects	27.000000	Number of Distinct Non-Detects	10.000000
Minimum Detect	40.000000	Minimum Non-Detect	8.2000000
Maximum Detect	540.00000	Maximum Non-Detect	10.000000
Variance Detected	14250.533	Percent Non-Detects	43.076923%
Mean Detected	194.45946	SD Detected	119.37560
Mean of Detected Logged Data	5.0533753	SD of Detected Logged Data	0.7168046

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9398500	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9360000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1046744	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1456575	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	114.22462	SD	128.06042
95% UTL95% Coverage	370.35426	95% KM UPL (t)	329.59696
90% KM Percentile (z)	278.34065	95% KM Percentile (z)	324.86526
99% KM Percentile (z)	412.13770	95% KM USL	505.66833

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	112.74692	SD	130.29553
95% UTL95% Coverage	373.34694	95% UPL (t)	331.87828
90% Percentile (z)	279.72736	95% Percentile (z)	327.06400
99% Percentile (z)	415.85965	95% USL	511.02272

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.3193759	**Anderson-Darling GOF Test**

Background Statistics for Soil Data Sets with Non-Detects			
5% A-D Critical Value	0.7569676	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0914105	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1464618	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.4595932	k star (bias corrected MLE)	2.2781847
Theta hat (MLE)	79.061636	Theta star (bias corrected MLE)	85.357196
nu hat (MLE)	182.00990	nu star (bias corrected)	168.58567
MLE Mean (bias corrected)	194.45946		
MLE Sd (bias corrected)	128.83522	95% Percentile of Chisquare (2k)	10.377238
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	113.28173
Maximum	540.00000	Median	59.000000
SD	130.08573	CV	1.1483381
k hat (MLE)	0.2438174	k star (bias corrected MLE)	0.2428207
Theta hat (MLE)	464.61701	Theta star (bias corrected MLE)	466.52412
nu hat (MLE)	31.696268	nu star (bias corrected)	31.566696
MLE Mean (bias corrected)	113.28173	MLE Sd (bias corrected)	229.88837
95% Percentile of Chisquare (2k)	2.3710765	90% Percentile	340.68136
95% Percentile	553.08220	99% Percentile	1120.8116
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	669.46404	919.36508	95% Approx. Gamma UPL	496.63858	630.58275
95% Gamma USL	1520.7598	2614.8736			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.7955904	nu hat (KM)	103.42676		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	505.70788	560.25515	95% Approx. Gamma UPL	395.26596	421.94731
95% Gamma USL	1015.9110	1270.5832			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.9367843	**Shapiro Wilk GOF Test**			
5% Shapiro Wilk Critical Value	0.9360000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.1149246	**Lilliefors GOF Test**			
5% Lilliefors Critical Value	0.1456575	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	123.99272	Mean in Log Scale	4.3171659		
SD in Original Scale	121.40698	SD in Log Scale	1.0498966		
95% UTL95% Coverage	612.18308	95% BCA UTL95% Coverage	388.00000		

Background Statistics for Soil Data Sets with Non-Detects			
95% Bootstrap (%) UTL95% Coverage	390.00000	95% UPL (t)	438.29175
90% Percentile (z)	287.91422	95% Percentile (z)	421.61485
99% Percentile (z)	862.28922	95% USL	1856.4042

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	3.7829329	95% KM UTL (Lognormal)95% Coverage	984.98874
KM SD of Logged Data	1.5547952	95% KM UPL (Lognormal)	600.51731
95% KM Percentile Lognormal (z)	566.99100	95% KM USL (Lognormal)	5092.3396

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	112.74692	Mean in Log Scale	3.5485637
SD in Original Scale	130.29553	SD in Log Scale	1.8248464
95% UTL95% Coverage	1337.2651	95% UPL (t)	748.14362
90% Percentile (z)	360.39417	95% Percentile (z)	699.36222
99% Percentile (z)	2425.4955	95% USL	9196.6245

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	390.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	377.00000	95% USL	540.00000
95% KM Chebyshev UPL	676.70452		

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

NICKEL

General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	55.000000		
Number of Detects	61.000000	Number of Non-Detects	4.0000000
Number of Distinct Detects	51.000000	Number of Distinct Non-Detects	4.0000000
Minimum Detect	314.00000	Minimum Non-Detect	323.00000
Maximum Detect	3300.0000	Maximum Non-Detect	346.00000
Variance Detected	443331.11	Percent Non-Detects	6.1538462%
Mean Detected	1201.4098	SD Detected	665.83114
Mean of Detected Logged Data	6.9475927	SD of Detected Logged Data	0.5493358

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8856061	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	4.5816E-6	Data Not Normal at 5% Significance Level	

Background Statistics for Soil Data Sets with Non-Detects			
Lilliefors Test Statistic	0.1430435	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1134407	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	1146.8000	SD	674.32024
95% UTL95% Coverage	2495.4869	95% KM UPL (t)	2280.8735
90% KM Percentile (z)	2010.9762	95% KM Percentile (z)	2255.9581
99% KM Percentile (z)	2715.5035	95% KM USL	3208.0022
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	1137.8000	SD	691.58729
95% UTL95% Coverage	2521.0221	95% UPL (t)	2300.9133
90% Percentile (z)	2024.1048	95% Percentile (z)	2275.3599
99% Percentile (z)	2746.6726	95% USL	3251.7826
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4862009	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7552824	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.0775268	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1144443	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	3.6387342	k star (bias corrected MLE)	3.4707090
Theta hat (MLE)	330.17247	Theta star (bias corrected MLE)	346.15689
nu hat (MLE)	443.92557	nu star (bias corrected)	423.42650
MLE Mean (bias corrected)	1201.4098		
MLE Sd (bias corrected)	644.88472	95% Percentile of Chisquare (2k)	13.981755
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	168.74791	Mean	1137.8614
Maximum	3300.0000	Median	1100.0000
SD	691.49897	CV	0.6077181
k hat (MLE)	2.6390849	k star (bias corrected MLE)	2.5275373
Theta hat (MLE)	431.15757	Theta star (bias corrected MLE)	450.18579
nu hat (MLE)	343.08103	nu star (bias corrected)	328.57986
MLE Mean (bias corrected)	1137.8614	MLE Sd (bias corrected)	715.71576
95% Percentile of Chisquare (2k)	11.155691	90% Percentile	2096.7486
95% Percentile	2511.0667	99% Percentile	3417.6407
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2928.0873	3052.7295	95% Approx. Gamma UPL	2527.7636	2601.3104
95% Gamma USL	4555.9599	4980.8400			

Background Statistics for Soil Data Sets with Non-Detects					
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	2.8922976		nu hat (KM)	375.99868	
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2777.2282	2855.2866	95% Approx. Gamma UPL	2419.2387	2461.8797
95% Gamma USL	4215.6790	4505.5811			
Lognormal GOF Test on Detected Observations Only					
Lilliefors Test Statistic	0.1122216	Lilliefors GOF Test			
5% Lilliefors Critical Value	0.1134407	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	1147.1062		Mean in Log Scale	6.8748249	
SD in Original Scale	679.18777		SD in Log Scale	0.6040876	
95% UTL95% Coverage	3239.0706		95% BCA UTL95% Coverage	3200.0000	
95% Bootstrap (%) UTL95% Coverage	3200.0000		95% UPL (t)	2672.5305	
90% Percentile (z)	2098.5342		95% Percentile (z)	2613.5393	
99% Percentile (z)	3944.7580		95% USL	6132.4296	
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution					
KM Mean of Logged Data	6.8738573		95% KM UTL (Lognormal)95% Coverage	3217.4529	
KM SD of Logged Data	0.6012233		95% KM UPL (Lognormal)	2657.1151	
95% KM Percentile Lognormal (z)	2598.7392		95% KM USL (Lognormal)	6073.0933	
Background DL/2 Statistics Assuming Lognormal Distribution					
Mean in Original Scale	1137.8000		Mean in Log Scale	6.8352565	
SD in Original Scale	691.58729		SD in Log Scale	0.6916686	
95% UTL95% Coverage	3709.4585		95% UPL (t)	2976.5092	
90% Percentile (z)	2256.7149		95% Percentile (z)	2901.4040	
99% Percentile (z)	4648.5852		95% USL	7703.9426	
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.					
Nonparametric Distribution Free Background Statistics					
Data appear to follow a Discernible Distribution at 5% Significance Level					
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)					
Order of Statistic, r	64.000000		95% UTL with95% Coverage	3200.0000	
Approximate f	1.6842105		Confidence Coefficient (CC) achieved by UTL	0.8423986	
95% UPL	2810.0000		95% USL	3300.0000	
95% KM Chebyshev UPL	4108.6175				

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

PHENANTHRENE

Background Statistics for Soil Data Sets with Non-Detects			
Lognormal GOF Test on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	7.4739340	Mean in Log Scale	-6.156160
SD in Original Scale	49.519043	SD in Log Scale	3.7687197
95% UTL95% Coverage	3.9810229	95% BCA UTL95% Coverage	73.929762
95% Bootstrap (%) UTL95% Coverage	92.000000	95% UPL (t)	1.1997135
90% Percentile (z)	0.2654441	95% Percentile (z)	1.0437631
99% Percentile (z)	13.615289	95% USL	213.51940
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	32.653846	Mean in Log Scale	3.3016897
SD in Original Scale	46.064402	SD in Log Scale	0.4180827
95% UTL95% Coverage	62.670059	95% UPL (t)	54.862071
90% Percentile (z)	46.408574	95% Percentile (z)	54.021089
99% Percentile (z)	71.829514	95% USL	97.480043
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	92.000000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	78.200000	95% USL	390.00000
95% KM Chebyshev UPL	237.03330		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
POTASSIUM			
General Statistics			
Total Number of Observations	60.000000	Number of Missing Observations	6.0000000
Number of Distinct Observations	58.000000		
Number of Detects	57.000000	Number of Non-Detects	3.0000000
Number of Distinct Detects	55.000000	Number of Distinct Non-Detects	3.0000000
Minimum Detect	19500.000	Minimum Non-Detect	1580.0000
Maximum Detect	149000.00	Maximum Non-Detect	13400.000
Variance Detected	8.6191E+8	Percent Non-Detects	5.0000000%
Mean Detected	68710.526	SD Detected	29358.247
Mean of Detected Logged Data	11.041931	SD of Detected Logged Data	0.4531473
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0168136	d2max (for USL)	3.0268634

Background Statistics for Soil Data Sets with Non-Detects			
General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	23.000000		
Number of Detects	2.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	92.000000	Minimum Non-Detect	40.000000
Maximum Detect	390.00000	Maximum Non-Detect	80.000000
Variance Detected	44402.000	Percent Non-Detects	96.923077%
Mean Detected	241.00000	SD Detected	210.71782
Mean of Detected Logged Data	5.2439677	SD of Detected Logged Data	1.0213155
Warning: Data set has only 2 Detected Values.			
This is not enough to compute meaningful or reliable statistics and estimates.			
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111
Normal GOF Test on Detects Only			
Not Enough Data to Perform GOF Test			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	46.184615	SD	43.450730
95% UTL95% Coverage	133.08906	95% KM UPL (t)	119.26016
90% KM Percentile (z)	101.86897	95% KM Percentile (z)	117.65471
99% KM Percentile (z)	147.26613	95% KM USL	179.00094
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	32.653846	SD	46.064402
95% UTL95% Coverage	124.78582	95% UPL (t)	110.12508
90% Percentile (z)	91.687752	95% Percentile (z)	108.42304
99% Percentile (z)	139.81567	95% USL	173.45941
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.2285546	k star (bias corrected MLE)	N/A
Theta hat (MLE)	108.14184	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	8.9142185	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	1.1297972	nu hat (KM)	146.87364

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	90.298892	86.238007	95% Approx. Gamma UPL	81.118536	77.680384
95% Gamma USL	125.69623	119.78638			

Background Statistics for Soil Data Sets with Non-Detects			
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9478471	Normal GOF Test on Detected Observations Only	
5% Shapiro Wilk P Value	0.0291246	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1045652	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1173536	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Approximate Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	65354.000	SD	31914.030
95% UTL95% Coverage	129718.65	95% KM UPL (t)	119127.90
90% KM Percentile (z)	106253.48	95% KM Percentile (z)	117847.91
99% KM Percentile (z)	139597.14	95% KM USL	161953.41
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	65417.333	SD	32062.576
95% UTL95% Coverage	130081.57	95% UPL (t)	119441.53
90% Percentile (z)	106507.18	95% Percentile (z)	118155.58
99% Percentile (z)	140006.04	95% USL	162466.37
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.7533802	Anderson-Darling GOF Test	
5% A-D Critical Value	0.7532282	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1187314	Kolmogrov-Smirnoff GOF	
5% K-S Critical Value	0.1181589	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	5.3843561	k star (bias corrected MLE)	5.1126648
Theta hat (MLE)	12761.141	Theta star (bias corrected MLE)	13439.278
nu hat (MLE)	613.81659	nu star (bias corrected)	582.84379
MLE Mean (bias corrected)	68710.526		
MLE Sd (bias corrected)	30387.825	95% Percentile of Chisquare (2k)	18.616943
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	17352.161	Mean	66142.608
Maximum	149000.00	Median	64250.000
SD	30748.892	CV	0.4648878
k hat (MLE)	4.2693940	k star (bias corrected MLE)	4.0670354
Theta hat (MLE)	15492.271	Theta star (bias corrected MLE)	16263.101
nu hat (MLE)	512.32728	nu star (bias corrected)	488.04425
MLE Mean (bias corrected)	66142.608	MLE Sd (bias corrected)	32797.621
95% Percentile of Chisquare (2k)	15.698107	90% Percentile	110101.40
95% Percentile	127649.95	99% Percentile	165099.78
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

Background Statistics for Soil Data Sets with Non-Detects					
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	146095.84	150250.25	95% Approx. Gamma UPL	128672.72	131129.62
95% Gamma USL	208654.24	221449.42			

The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	4.1935424	nu hat (KM)	503.22509
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	173127.98	190198.94	95% Approx. Gamma UPL	148284.88	159536.63
95% Gamma USL	265484.32	311070.72			

Lognormal GOF Test on Detected Observations Only		
Lilliefors Test Statistic	0.1287625	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1173536	Data Not Lognormal at 5% Significance Level
Detected Data appear Approximate Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	66359.685	Mean in Log Scale	10.989074
SD in Original Scale	30411.564	SD in Log Scale	0.4988846
95% UTL95% Coverage	161980.46	95% BCA UTL95% Coverage	126200.00
95% Bootstrap (%) UTL95% Coverage	126200.00	95% UPL (t)	137265.86
90% Percentile (z)	112242.85	95% Percentile (z)	134546.60
99% Percentile (z)	189028.46	95% USL	268103.74

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	10.858094	95% KM UTL (Lognormal)95% Coverage	327642.92
KM SD of Logged Data	0.9131165	95% KM UPL (Lognormal)	241991.94
95% KM Percentile Lognormal (z)	233289.82	95% KM USL (Lognormal)	824038.65

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	65417.333	Mean in Log Scale	10.863809
SD in Original Scale	32062.576	SD in Log Scale	0.9239198
95% UTL95% Coverage	336779.25	95% UPL (t)	247849.73
90% Percentile (z)	170733.60	95% Percentile (z)	238833.45
99% Percentile (z)	448277.51	95% USL	856310.14
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			

Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	59.000000	95% UTL with95% Coverage	125000.00
Approximate f	1.5526316	Confidence Coefficient (CC) achieved by UTL	0.8084466
95% UPL	120800.00	95% USL	149000.00
95% KM Chebyshev UPL	205618.49		

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

Background Statistics for Soil Data Sets with Non-Detects

PYRENE

General Statistics

Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	24.000000		
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	21.000000
Minimum Detect	280.00000	Minimum Non-Detect	37.000000
Maximum Detect	3500.0000	Maximum Non-Detect	100.00000
Variance Detected	2800133.3	Percent Non-Detects	95.454545%
Mean Detected	1626.6667	SD Detected	1673.3599
Mean of Detected Logged Data	6.9327911	SD of Detected Logged Data	1.2643299

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9256882	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2901856	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	109.25758	SD	441.01794
95% UTL95% Coverage	989.95902	95% KM UPL (t)	850.71001
90% KM Percentile (z)	674.44481	95% KM Percentile (z)	834.66754
99% KM Percentile (z)	1135.2187	95% KM USL	1459.8084

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	100.15909	SD	446.01069
95% UTL95% Coverage	990.83092	95% UPL (t)	850.00548
90% Percentile (z)	671.74479	95% Percentile (z)	833.78140
99% Percentile (z)	1137.7351	95% USL	1465.9995

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.2232028	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1329.8422	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	7.3392166	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

Background Statistics for Soil Data Sets with Non-Detects			
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	73.948939
Maximum	3500.0000	Median	0.0100000
SD	450.25604	CV	6.0887424
k hat (MLE)	0.0972079	k star (bias corrected MLE)	0.1028904
Theta hat (MLE)	760.72986	Theta star (bias corrected MLE)	718.71597
nu hat (MLE)	12.831441	nu star (bias corrected)	13.581527
MLE Mean (bias corrected)	73.948939	MLE Sd (bias corrected)	230.53911
95% Percentile of Chisquare (2k)	1.1922523	90% Percentile	199.09244
95% Percentile	428.44539	99% Percentile	1157.9824
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	151.72369	77.842295	95% Approx. Gamma UPL	97.308061	45.028566
95% Gamma USL	476.42204	326.91425			
The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	0.0613749	nu hat (KM)	8.1014831
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	354.07507	299.34181	95% Approx. Gamma UPL	279.17056	235.18618
95% Gamma USL	703.26107	615.46864			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9976638	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1888294	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	74.334585	Mean in Log Scale	-3.986684
SD in Original Scale	450.19354	SD in Log Scale	4.0013526
95% UTL95% Coverage	54.812238	95% BCA UTL95% Coverage	895.00000
95% Bootstrap (%) UTL95% Coverage	1100.0000	95% UPL (t)	15.494858
90% Percentile (z)	3.1306962	95% Percentile (z)	13.395985
99% Percentile (z)	204.76313	95% USL	3892.6823
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	3.7619121	95% KM UTL (Lognormal)95% Coverage	183.44593
KM SD of Logged Data	0.7261024	95% KM UPL (Lognormal)	145.86143
95% KM Percentile Lognormal (z)	142.05927	95% KM USL (Lognormal)	397.61778
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	100.15909	Mean in Log Scale	3.4213786

Background Statistics for Soil Data Sets with Non-Detects			
SD in Original Scale	446.01069	SD in Log Scale	0.8670804
95% UTL95% Coverage	172.93501	95% UPL (t)	131.51750
90% Percentile (z)	92.998831	95% Percentile (z)	127.43406
99% Percentile (z)	230.09893	95% USL	435.58131

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	65.000000	95% UTL with95% Coverage	1100.0000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	217.00000	95% USL	3500.0000
95% KM Chebyshev UPL	2046.1188		

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

SELENIUM

General Statistics

Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	53.000000		
Number of Detects	21.000000	Number of Non-Detects	45.000000
Number of Distinct Detects	18.000000	Number of Distinct Non-Detects	36.000000
Minimum Detect	150.00000	Minimum Non-Detect	100.00000
Maximum Detect	1400.0000	Maximum Non-Detect	711.00000
Variance Detected	105635.41	Percent Non-Detects	68.181818%
Mean Detected	454.71429	SD Detected	325.01602
Mean of Detected Logged Data	5.9225240	SD of Detected Logged Data	0.6219895

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8039847	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9080000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2335101	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1933411	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	297.91638	SD	238.41392
95% UTL95% Coverage	774.02281	95% KM UPL (t)	698.74491
90% KM Percentile (z)	603.45610	95% KM Percentile (z)	690.07237
99% KM Percentile (z)	852.55008	95% KM USL	1028.0230

DL/2 Substitution Background Statistics Assuming Normal Distribution

Background Statistics for Soil Data Sets with Non-Detects			
Mean	330.08333	SD	214.38600
95% UTL95% Coverage	758.20664	95% UPL (t)	690.51543
90% Percentile (z)	604.83005	95% Percentile (z)	682.71693
99% Percentile (z)	828.81976	95% USL	986.60809

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.6223800	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7507755	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1663614	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.1911901	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only			
k hat (MLE)	2.6912245	k star (bias corrected MLE)	2.3385099
Theta hat (MLE)	168.96186	Theta star (bias corrected MLE)	194.44617
nu hat (MLE)	113.03143	nu star (bias corrected)	98.217414
MLE Mean (bias corrected)	454.71429		
MLE Sd (bias corrected)	297.35072	95% Percentile of Chisquare (2k)	10.567070

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	254.03678
Maximum	1400.0000	Median	189.39447
SD	238.68816	CV	0.9395811
k hat (MLE)	0.5967904	k star (bias corrected MLE)	0.5797645
Theta hat (MLE)	425.67173	Theta star (bias corrected MLE)	438.17234
nu hat (MLE)	78.776326	nu star (bias corrected)	76.528918
MLE Mean (bias corrected)	254.03678	MLE Sd (bias corrected)	333.63436
95% Percentile of Chisquare (2k)	4.2242504	90% Percentile	665.78948
95% Percentile	925.47484	99% Percentile	1555.4673

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1013.5960	1309.0611	95% Approx. Gamma UPL	818.25500	1006.0145
95% Gamma USL	1897.2122	2852.4129			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)		1.5614409	nu hat (KM)		206.11020
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	809.25225	826.50455	95% Approx. Gamma UPL	691.85611	698.53659
95% Gamma USL	1301.9504	1390.8289			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9548029	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.9080000	Detected Data appear Lognormal at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Lilliefors Test Statistic	0.1225388	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1933411	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	280.35791	Mean in Log Scale	5.4606350
SD in Original Scale	221.56291	SD in Log Scale	0.5435402
95% UTL95% Coverage	696.50201	95% BCA UTL95% Coverage	1000.0000
95% Bootstrap (%) UTL95% Coverage	1000.0000	95% UPL (t)	586.66317
90% Percentile (z)	472.10894	95% Percentile (z)	575.17769
99% Percentile (z)	833.05406	95% USL	1242.8280
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	5.4506738	95% KM UTL (Lognormal)95% Coverage	913.93175
KM SD of Logged Data	0.6845767	95% KM UPL (Lognormal)	736.27561
95% KM Percentile Lognormal (z)	718.16717	95% KM USL (Lognormal)	1895.2134
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	330.08333	Mean in Log Scale	5.6168568
SD in Original Scale	214.38600	SD in Log Scale	0.6570568
95% UTL95% Coverage	1021.4538	95% UPL (t)	830.07836
90% Percentile (z)	638.36417	95% Percentile (z)	810.47380
99% Percentile (z)	1268.2578	95% USL	2056.9796
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	1000.0000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	898.85000	95% USL	1400.0000
95% KM Chebyshev UPL	1344.9818		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
SILVER			
General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	23.000000		
Number of Detects	3.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	20.000000
Minimum Detect	140.00000	Minimum Non-Detect	10.000000
Maximum Detect	986.00000	Maximum Non-Detect	123.00000
Variance Detected	198289.33	Percent Non-Detects	95.454545%
Mean Detected	643.33333	SD Detected	445.29690

Background Statistics for Soil Data Sets with Non-Detects			
Mean of Detected Logged Data	6.1749660	SD of Detected Logged Data	1.0729516

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9023459	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3075452	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	38.787879	SD	153.01094
95% UTL95% Coverage	344.34678	95% KM UPL (t)	296.03441
90% KM Percentile (z)	234.87929	95% KM Percentile (z)	290.46848
99% KM Percentile (z)	394.74456	95% KM USL	507.36078

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	65.132576	SD	150.95393
95% UTL95% Coverage	366.58368	95% UPL (t)	318.92080
90% Percentile (z)	258.58782	95% Percentile (z)	313.42970
99% Percentile (z)	416.30394	95% USL	527.40619

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	1.8634791	k star (bias corrected MLE)	N/A
Theta hat (MLE)	345.23239	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	11.180874	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	29.251970
Maximum	986.00000	Median	0.0100000
SD	155.99493	CV	5.3328010
k hat (MLE)	0.1074239	k star (bias corrected MLE)	0.1126420
Theta hat (MLE)	272.30420	Theta star (bias corrected MLE)	259.68979
nu hat (MLE)	14.179950	nu star (bias corrected)	14.868740

Background Statistics for Soil Data Sets with Non-Detects			
MLE Mean (bias corrected)	29.251970	MLE Sd (bias corrected)	87.157546
95% Percentile of Chisquare (2k)	1.2949834	90% Percentile	81.330864
95% Percentile	168.14698	99% Percentile	437.47266

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	65.047090	35.406646	95% Approx. Gamma UPL	42.031488	20.808369
95% Gamma USL	201.22462	143.90405			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)	0.0642609		nu hat (KM)	8.4824440
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	130.82574	109.22965	95% Approx. Gamma UPL	101.03606	83.679034
95% Gamma USL	273.36724	239.96372		

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.8274414	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.3509259	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	30.433755	Mean in Log Scale	-1.824680
SD in Original Scale	155.82590	SD in Log Scale	2.9797691
95% UTL95% Coverage	61.919947	95% BCA UTL95% Coverage	638.00000
95% Bootstrap (%) UTL95% Coverage	774.50000	95% UPL (t)	24.167204
90% Percentile (z)	7.3452086	95% Percentile (z)	21.684647
99% Percentile (z)	165.22365	95% USL	1480.9119

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.4786024	95% KM UTL (Lognormal)95% Coverage	62.302858
KM SD of Logged Data	0.8279551	95% KM UPL (Lognormal)	47.970441
95% KM Percentile Lognormal (z)	46.547222	95% KM USL (Lognormal)	150.51907

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	65.132576	Mean in Log Scale	3.3289822
SD in Original Scale	150.95393	SD in Log Scale	1.2826277
95% UTL95% Coverage	361.53418	95% UPL (t)	241.13908
90% Percentile (z)	144.42145	95% Percentile (z)	230.14672
99% Percentile (z)	551.59851	95% USL	1417.7634

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	65.000000	95% UTL with95% Coverage	804.00000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963

Background Statistics for Soil Data Sets with Non-Detects			
95% UPL	134.05000	95% USL	986.00000
95% KM Chebyshev UPL	710.78085		

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

SODIUM

General Statistics			
Total Number of Observations	64.000000	Number of Missing Observations	2.0000000
Number of Distinct Observations	56.000000		
Number of Detects	15.000000	Number of Non-Detects	49.000000
Number of Distinct Detects	15.000000	Number of Distinct Non-Detects	43.000000
Minimum Detect	40000.000	Minimum Non-Detect	1390.0000
Maximum Detect	121000.00	Maximum Non-Detect	44600.000
Variance Detected	6.4250E+8	Percent Non-Detects	76.562500%
Mean Detected	60146.667	SD Detected	25347.580
Mean of Detected Logged Data	10.936989	SD of Detected Logged Data	0.3613499

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0032433	d2max (for USL)	3.0509677

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.7663159	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8810000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2882199	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2287642	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	15596.674	SD	27657.295
95% UTL95% Coverage	71000.965	95% KM UPL (t)	62127.137
90% KM Percentile (z)	51040.923	95% KM Percentile (z)	61088.875
99% KM Percentile (z)	79937.162	95% KM USL	99978.187

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	24238.906	SD	24639.593
95% UTL95% Coverage	73598.007	95% UPL (t)	65692.408
90% Percentile (z)	55815.816	95% Percentile (z)	64767.431
99% Percentile (z)	81559.172	95% USL	99413.510

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.3155300	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7379551	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2664585	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.2217877	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Gamma Statistics on Detected Data Only			
k hat (MLE)	7.5644224	k star (bias corrected MLE)	6.0959824
Theta hat (MLE)	7951.2570	Theta star (bias corrected MLE)	9866.6077
nu hat (MLE)	226.93267	nu star (bias corrected)	182.87947
MLE Mean (bias corrected)	60146.667		
MLE Sd (bias corrected)	24360.697	95% Percentile of Chisquare (2k)	21.283629
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	14198.360
Maximum	121000.00	Median	0.0100000
SD	28278.980	CV	1.9917075
k hat (MLE)	0.0833327	k star (bias corrected MLE)	0.0898431
Theta hat (MLE)	170381.68	Theta star (bias corrected MLE)	158035.03
nu hat (MLE)	10.666582	nu star (bias corrected)	11.499919
MLE Mean (bias corrected)	14198.360	MLE Sd (bias corrected)	47369.170
95% Percentile of Chisquare (2k)	1.0468893	90% Percentile	35964.078
95% Percentile	82722.588	99% Percentile	237805.42
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	77859.190	86101.362	95% Approx. Gamma UPL	52417.665	51316.884
95% Gamma USL	215242.24	327271.93			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.3180128	nu hat (KM)	40.705638		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	72940.583	74508.978	95% Approx. Gamma UPL	54647.344	53645.043
95% Gamma USL	160118.93	186301.88			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.8235309	**Shapiro Wilk GOF Test**			
5% Shapiro Wilk Critical Value	0.8810000	Data Not Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.2458906	**Lilliefors GOF Test**			
5% Lilliefors Critical Value	0.2287642	Data Not Lognormal at 5% Significance Level			
Data Not Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	26086.639	Mean in Log Scale	9.9505074		
SD in Original Scale	22527.976	SD in Log Scale	0.5898565		
95% UTL95% Coverage	68332.005	95% BCA UTL95% Coverage	99765.000		
95% Bootstrap (%) UTL95% Coverage	102000.00	95% UPL (t)	56549.882		
90% Percentile (z)	44642.381	95% Percentile (z)	55311.439		
99% Percentile (z)	82678.828	95% USL	126771.38		

Background Statistics for Soil Data Sets with Non-Detects			
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	24238.906	Mean in Log Scale	9.3180155
SD in Original Scale	24639.593	SD in Log Scale	1.5895573
95% UTL95% Coverage	268951.28	95% UPL (t)	161502.67
90% Percentile (z)	85401.173	95% Percentile (z)	152147.32
99% Percentile (z)	449494.42	95% USL	1422182.8
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	63.000000	95% UTL with95% Coverage	102000.00
Approximate f	1.6578947	Confidence Coefficient (CC) achieved by UTL	0.8360788
95% UPL	85625.000	95% USL	121000.00
95% KM Chebyshev UPL	137090.21		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
THALLIUM			
General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	34.000000		
Number of Detects	2.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	33.000000
Minimum Detect	379.00000	Minimum Non-Detect	20.000000
Maximum Detect	386.00000	Maximum Non-Detect	417.00000
Variance Detected	24.500000	Percent Non-Detects	96.923077%
Mean Detected	382.50000	SD Detected	4.9497475
Mean of Detected Logged Data	5.9466868	SD of Detected Logged Data	0.0129409
Warning: Data set has only 2 Detected Values.			
This is not enough to compute meaningful or reliable statistics and estimates.			
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111
Normal GOF Test on Detects Only			
Not Enough Data to Perform GOF Test			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	33.160333	SD	67.779534
95% UTL95% Coverage	168.72406	95% KM UPL (t)	147.15213
90% KM Percentile (z)	120.02330	95% KM Percentile (z)	144.64775
99% KM Percentile (z)	190.83911	95% KM USL	240.34279

Background Statistics for Soil Data Sets with Non-Detects			
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	130.84615	SD	93.609308
95% UTL95% Coverage	318.07121	95% UPL (t)	288.27853
90% Percentile (z)	250.81131	95% Percentile (z)	284.81976
99% Percentile (z)	348.61397	95% USL	416.98277
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	11943.034	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.0320270	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	47772.136	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	0.2393540	nu hat (KM)	31.116014
WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage 96.046049	87.892351	95% Approx. Gamma UPL 80.010222	73.148573
95% Gamma USL 164.36555	153.16861		
Lognormal GOF Test on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	351.27885	Mean in Log Scale	5.8612499
SD in Original Scale	9.1729403	SD in Log Scale	0.0258102
95% UTL95% Coverage	369.76665	95% BCA UTL95% Coverage	377.32766
95% Bootstrap (%) UTL95% Coverage	379.00000	95% UPL (t)	366.74163
90% Percentile (z)	362.97249	95% Percentile (z)	366.39205
99% Percentile (z)	372.89372	95% USL	379.98975
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	130.84615	Mean in Log Scale	4.2661063
SD in Original Scale	93.609308	SD in Log Scale	1.3846346
95% UTL95% Coverage	1136.2295	95% UPL (t)	731.27402
90% Percentile (z)	420.13953	95% Percentile (z)	694.80238
99% Percentile (z)	1785.1325	95% USL	4907.5697
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	406.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986

Background Statistics for Soil Data Sets with Non-Detects			
95% UPL	401.80000	95% USL	417.00000
95% KM Chebyshev UPL	330.86845		

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

TOTAL DDD/DDE/DDT

General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	37.000000		
Number of Detects	6.0000000	Number of Non-Detects	60.000000
Number of Distinct Detects	6.0000000	Number of Distinct Non-Detects	31.000000
Minimum Detect	2.9300000	Minimum Non-Detect	0.2990000
Maximum Detect	12.500000	Maximum Non-Detect	7.2000000
Variance Detected	16.707720	Percent Non-Detects	90.909091%
Mean Detected	8.2400000	SD Detected	4.0875078
Mean of Detected Logged Data	1.9743419	SD of Detected Logged Data	0.6080553

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8963699	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1911391	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3617080	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	1.0224893	SD	2.5456152
95% UTL95% Coverage	6.1060171	95% KM UPL (t)	5.3022529
90% KM Percentile (z)	4.2848264	95% KM Percentile (z)	5.2096537
99% KM Percentile (z)	6.9444758	95% KM USL	8.8180513

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	1.0171212	SD	2.6006531
95% UTL95% Coverage	6.2105582	95% UPL (t)	5.3894162
90% Percentile (z)	4.3499922	95% Percentile (z)	5.2948148
99% Percentile (z)	7.0671449	95% USL	8.9812284

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.4257225	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7001529	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2320665	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.3336694	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Background Statistics for Soil Data Sets with Non-Detects			
Gamma Statistics on Detected Data Only			
k hat (MLE)	3.8718948	k star (bias corrected MLE)	2.0470585
Theta hat (MLE)	2.1281570	Theta star (bias corrected MLE)	4.0252879
nu hat (MLE)	46.462738	nu star (bias corrected)	24.564702
MLE Mean (bias corrected)	8.2400000		
MLE Sd (bias corrected)	5.7591989	95% Percentile of Chisquare (2k)	9.6399573
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.7581818
Maximum	12.500000	Median	0.0100000
SD	2.6399032	CV	3.4818867
k hat (MLE)	0.1976506	k star (bias corrected MLE)	0.1987675
Theta hat (MLE)	3.8359706	Theta star (bias corrected MLE)	3.8144159
nu hat (MLE)	26.089877	nu star (bias corrected)	26.237307
MLE Mean (bias corrected)	0.7581818	MLE Sd (bias corrected)	1.7005942
95% Percentile of Chisquare (2k)	2.0516430	90% Percentile	2.2930289
95% Percentile	3.9129098	99% Percentile	8.3770981
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2.7827494	2.2362977	95% Approx. Gamma UPL	1.9221294	1.4574423
95% Gamma USL	7.4978494	7.2641043			

The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	0.1613363	nu hat (KM)	21.296390

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	3.7872697	3.4679372	95% Approx. Gamma UPL	2.9654486	2.6758106
95% Gamma USL	7.6521255	7.4781032			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.8695805	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2208069	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3617080	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects		

Mean in Original Scale	1.0872851	Mean in Log Scale	-0.962266
SD in Original Scale	2.5597726	SD in Log Scale	1.1936515
95% UTL95% Coverage	4.1430213	95% BCA UTL95% Coverage	11.645000
95% Bootstrap (%) UTL95% Coverage	12.100000	95% UPL (t)	2.8420804
90% Percentile (z)	1.7637814	95% Percentile (z)	2.7213173
99% Percentile (z)	6.1385143	95% USL	14.777586

Background Statistics for Soil Data Sets with Non-Detects			
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	-0.916858	95% KM UTL (Lognormal)95% Coverage	2.5662855
KM SD of Logged Data	0.9310671	95% KM UPL (Lognormal)	1.9126317
95% KM Percentile Lognormal (z)	1.8489385	95% KM USL (Lognormal)	6.9198563
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	1.0171212	Mean in Log Scale	-1.157629
SD in Original Scale	2.6006531	SD in Log Scale	1.1343529
95% UTL95% Coverage	3.0272176	95% UPL (t)	2.1158956
90% Percentile (z)	1.3446076	95% Percentile (z)	2.0303638
99% Percentile (z)	4.3985279	95% USL	10.136622
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	12.100000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	9.3420000	95% USL	12.500000
95% KM Chebyshev UPL	12.202314		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
TRICHLOROFLUOROMETHANE			
General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	26.000000		
Number of Detects	5.0000000	Number of Non-Detects	61.000000
Number of Distinct Detects	4.0000000	Number of Distinct Non-Detects	23.000000
Minimum Detect	2.0000000	Minimum Non-Detect	0.4300000
Maximum Detect	7.0000000	Maximum Non-Detect	2.0000000
Variance Detected	3.3000000	Percent Non-Detects	92.424242%
Mean Detected	4.4000000	SD Detected	1.8165902
Mean of Detected Logged Data	1.4042168	SD of Detected Logged Data	0.4587510
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9624420	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2128605	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3962312	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			

Background Statistics for Soil Data Sets with Non-Detects			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	0.7307576	SD	1.1417322
95% UTL95% Coverage	3.0107673	95% KM UPL (t)	2.6502716
90% KM Percentile (z)	2.1939463	95% KM Percentile (z)	2.6087400
99% KM Percentile (z)	3.3868239	95% KM USL	4.2271400
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.7840152	SD	1.1780147
95% UTL95% Coverage	3.1364801	95% UPL (t)	2.7645283
90% Percentile (z)	2.2937017	95% Percentile (z)	2.7216769
99% Percentile (z)	3.5244871	95% USL	4.3915072
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.2919958	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.6801159	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2560062	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.3580763	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	6.6231890	k star (bias corrected MLE)	2.7826089
Theta hat (MLE)	0.6643325	Theta star (bias corrected MLE)	1.5812499
nu hat (MLE)	66.231890	nu star (bias corrected)	27.826089
MLE Mean (bias corrected)	4.4000000		
MLE Sd (bias corrected)	2.6377072	95% Percentile of Chisquare (2k)	11.936606
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	0.3484046
Maximum	7.0000000	Median	0.0100000
SD	1.2536122	CV	3.5981505
k hat (MLE)	0.2358581	k star (bias corrected MLE)	0.2352383
Theta hat (MLE)	1.4771789	Theta star (bias corrected MLE)	1.4810710
nu hat (MLE)	31.133269	nu star (bias corrected)	31.051454
MLE Mean (bias corrected)	0.3484046	MLE Sd (bias corrected)	0.7183397
95% Percentile of Chisquare (2k)	2.3183544	90% Percentile	1.0496783
95% Percentile	1.7168238	99% Percentile	3.5081986
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.2877356	1.0494774	95% Approx. Gamma UPL	0.9069275	0.7057712
95% Gamma USL	3.3267330	3.1728443			

The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	0.4096549	nu hat (KM)	54.074445

Background Statistics for Soil Data Sets with Non-Detects					
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2.1327542	2.0221501	95% Approx. Gamma UPL	1.7860218	1.6852890
95% Gamma USL	3.6282595	3.5400151			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9334170	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7620000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2844181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3962312	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	0.6176763	Mean in Log Scale	-1.273295
SD in Original Scale	1.2069806	SD in Log Scale	1.1129962
95% UTL95% Coverage	2.5839771	95% BCA UTL95% Coverage	5.0000000
95% Bootstrap (%) UTL95% Coverage	5.0000000	95% UPL (t)	1.8183096
90% Percentile (z)	1.1654032	95% Percentile (z)	1.7461632
99% Percentile (z)	3.7281846	95% USL	8.4577893

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	-0.673653	95% KM UTL (Lognormal)95% Coverage	1.7083879
KM SD of Logged Data	0.6055176	95% KM UPL (Lognormal)	1.4110884
95% KM Percentile Lognormal (z)	1.3803471	95% KM USL (Lognormal)	3.2565014

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	0.7840152	Mean in Log Scale	-0.726754
SD in Original Scale	1.1780147	SD in Log Scale	0.8366191
95% UTL95% Coverage	2.5701204	95% UPL (t)	1.9734728
90% Percentile (z)	1.4125782	95% Percentile (z)	1.9143191
99% Percentile (z)	3.3855388	95% USL	6.2667984

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	5.0000000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	4.0000000	95% USL	7.0000000
95% KM Chebyshev UPL	5.7450134		

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

VANADIUM

General Statistics

Total Number of Observations	63.000000	Number of Distinct Observations	55.000000

Background Statistics for Soil Data Sets with Non-Detects			
		Number of Missing Observations	3.0000000
Minimum	323.00000	First Quartile	3760.0000
Second Largest	11100.000	Median	4700.0000
Maximum	11500.000	Third Quartile	6050.0000
Mean	5130.5238	SD	2304.5755
Coefficient of Variation	0.4491891	Skewness	0.8762321
Mean of logged Data	8.4268218	SD of logged Data	0.5456089

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0065013	d2max (for USL)	3.0451154

Normal GOF Test		
Shapiro Wilk Test Statistic	0.9374956	**Normal GOF Test**
5% Shapiro Wilk P Value	0.0047391	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.1112678	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.1116255	Data appear Normal at 5% Significance Level
Data appear Approximate Normal at 5% Significance Level		

Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	9754.6576	90% Percentile (z)	8083.9561
95% UPL (t)	9009.1344	95% Percentile (z)	8921.2132
95% USL	12148.222	99% Percentile (z)	10491.768

Gamma GOF Test		
A-D Test Statistic	0.6132250	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7539080	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.0930269	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.1125768	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	4.4650122	k star (bias corrected MLE)	4.2629746
Theta hat (MLE)	1149.0504	Theta star (bias corrected MLE)	1203.5080
nu hat (MLE)	562.59153	nu star (bias corrected)	537.13479
MLE Mean (bias corrected)	5130.5238	MLE Sd (bias corrected)	2484.8795

Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	9807.2499	90% Percentile	8460.3252
95% Hawkins Wixley (HW) Approx. Gamma UPL	10064.381	95% Percentile	9780.2978
95% WH Approx. Gamma UTL with 95% Coverage	11063.735	99% Percentile	12590.749
95% HW Approx. Gamma UTL with 95% Coverage	11464.591		
95% WH USL	15814.057	95% HW USL	16961.117

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.8822927	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	1.7822E-6	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1302368	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.1116255	Data Not Lognormal at 5% Significance Level
Data Not Lognormal at 5% Significance Level		

Background Statistics for Soil Data Sets with Non-Detects			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	13651.255	90% Percentile (z)	9191.6221
95% UPL (t)	11442.433	95% Percentile (z)	11206.716
95% USL	24058.986	99% Percentile (z)	16254.058
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	62.000000	95% UTL with 95% Coverage	11100.000
Approximate f	1.6315789	Confidence Coefficient (CC) achieved by UTL	0.8295302
95% Percentile Bootstrap UTL with 95% Coverage	11100.000	95% BCA Bootstrap UTL with 95% Coverage	11100.000
95% UPL	10940.000	90% Percentile	7980.0000
90% Chebyshev UPL	12098.905	95% Percentile	10100.000
95% Chebyshev UPL	15255.347	99% Percentile	11252.000
95% USL	11500.000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
ZINC			
General Statistics			
Total Number of Observations	66.000000	Number of Missing Observations	0
Number of Distinct Observations	50.000000		
Number of Detects	28.000000	Number of Non-Detects	38.000000
Number of Distinct Detects	25.000000	Number of Distinct Non-Detects	25.000000
Minimum Detect	1600.0000	Minimum Non-Detect	150.00000
Maximum Detect	18000.000	Maximum Non-Detect	221.00000
Variance Detected	19580488	Percent Non-Detects	57.575758%
Mean Detected	5620.7143	SD Detected	4424.9846
Mean of Detected Logged Data	8.3703761	SD of Detected Logged Data	0.7238704
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	1.9969742	d2max (for USL)	3.0623490
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8206681	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.9240000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2278306	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.1674383	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	2470.9091	SD	3914.1552
95% UTL95% Coverage	10287.376	95% KM UPL (t)	9051.5028
90% KM Percentile (z)	7487.1009	95% KM Percentile (z)	8909.1215
99% KM Percentile (z)	11576.596	95% KM USL	14457.418

Background Statistics for Soil Data Sets with Non-Detects			
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	2439.7727	SD	3962.8042
95% UTL95% Coverage	10353.390	95% UPL (t)	9102.1565
90% Percentile (z)	7518.3106	95% Percentile (z)	8958.0056
99% Percentile (z)	11658.634	95% USL	14575.262
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.9767189	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7577717	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1985777	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.1675148	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	2.0461240	k star (bias corrected MLE)	1.8507059
Theta hat (MLE)	2747.0057	Theta star (bias corrected MLE)	3037.0650
nu hat (MLE)	114.58294	nu star (bias corrected)	103.63953
MLE Mean (bias corrected)	5620.7143		
MLE Sd (bias corrected)	4131.6431	95% Percentile of Chisquare (2k)	8.9994646
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	2384.5512
Maximum	18000.000	Median	0.0100000
SD	3996.1128	CV	1.6758343
k hat (MLE)	0.1158575	k star (bias corrected MLE)	0.1206922
Theta hat (MLE)	20581.768	Theta star (bias corrected MLE)	19757.291
nu hat (MLE)	15.293184	nu star (bias corrected)	15.931372
MLE Mean (bias corrected)	2384.5512	MLE Sd (bias corrected)	6863.8380
95% Percentile of Chisquare (2k)	1.3764137	90% Percentile	6766.6353
95% Percentile	13597.103	99% Percentile	34415.286
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	14817.104	19394.438	95% Approx. Gamma UPL	10391.383	12231.616
95% Gamma USL	38633.330	67779.305			

The following statistics are computed using gamma distribution and KM estimates			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
k hat (KM)	0.3985084	nu hat (KM)	52.603104

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	11677.001	12547.312	95% Approx. Gamma UPL	8879.7832	9154.0531
95% Gamma USL	25321.881	31202.017			

Lognormal GOF Test on Detected Observations Only

Background Statistics for Soil Data Sets with Non-Detects			
Shapiro Wilk Test Statistic	0.9271434	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.9240000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1649977	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.1674383	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	2729.0983	Mean in Log Scale	7.1981866
SD in Original Scale	3796.4711	SD in Log Scale	1.1486656
95% UTL95% Coverage	13253.835	95% BCA UTL95% Coverage	14300.000
95% Bootstrap (%) UTL95% Coverage	14400.000	95% UPL (t)	9222.0930
90% Percentile (z)	5827.0191	95% Percentile (z)	8844.6979
99% Percentile (z)	19348.738	95% USL	45062.317
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	6.4359799	95% KM UTL (Lognormal)95% Coverage	19504.393
KM SD of Logged Data	1.7238155	95% KM UPL (Lognormal)	11317.547
95% KM Percentile Lognormal (z)	10629.667	95% KM USL (Lognormal)	122382.25
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	2439.7727	Mean in Log Scale	6.1771233
SD in Original Scale	3962.8042	SD in Log Scale	1.9543837
95% UTL95% Coverage	23860.437	95% UPL (t)	12873.047
90% Percentile (z)	5894.4515	95% Percentile (z)	11989.642
99% Percentile (z)	45419.628	95% USL	191401.41
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	65.000000	95% UTL with95% Coverage	14400.000
Approximate f	1.7105263	Confidence Coefficient (CC) achieved by UTL	0.8484963
95% UPL	12985.000	95% USL	18000.000
95% KM Chebyshev UPL	19661.083		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			

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Appendix C7
Soil Outliers Compared to
USL Concentrations

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Table C7
Soil Outliers Compared To USL Concentrations
MCRD Parris Island, South Carolina

Parameter	Lowest Outlier	Is Lowest Outlier > USL?	USL	UTL	BTV Selected
2,4'-D	See Table 5				
4,4'-DDD	See Table 5				
4,4'-DDE	NA		6		6
4,4'-DDT	NA		4		4
Alpha-Chlordane	[a] 9.21	YES	5		5
Aluminum	[a] 10,200,000	YES	9,200,000		9,200,000
Anthracene	See Table 5				
Arsenic	[a] 3,300	NO	3,420	2,190	2,190
Barium	NA		32,000		32,000
Benzaldehyde	See Table 5				
Benzo(a)anthracene	See Table 5				
Benzo(a)pyrene	NA		609		609
Benzo(b)fluoranthene	[a] 1,900	YES	540		540
Benzo(g,h,i)perylene	See Table 5				
Benzo(k)fluoranthene	[a] 1,500	YES	520		520
Beryllium	[a] 265	YES	247		247
Cadmium	NA		171		171
Calcium	[a] 5,260,000	YES	3,530,000		3,530,000
Carbazole	See Table 5				
Carbon Disulfide	[a] 230	YES	100		100
Chromium	See Table 4				
Chrysene	NA		2,500		2,500
Cobalt	[a] 810	NO	933	632	632
Copper	NA		5,280		5,280
Dalapon	NA		25		25
Dibenzo(a,h)anthracene	NA		550		550
Dichlorodifluoromethane	NA		3		3
Endosulfan Sulfate	NA		14		14
Endrin	See Table 5				
Endrin Aldehyde	See Table 5				
Fluoranthene	[a] 5800	YES	920		920
Gamma-Chlordane	See Table 5				
Heptachlor	See Table 5				
Indeno(1,2,3-CD)pyrene	See Table 5				
Iron	[a] 7,990,000	YES	5,900,000		5,900,000
Lead	[a] 12,700	NO	13,100	9,150	9,150
Magnesium	[a] 567,000	YES	375,000		375,000
Manganese	[a] 40,600	NO	51,100	32,300	32,300
Mercury	[a] 770	YES	506		506
Methoxychlor	See Table 5				
Methyl Acetate	See Table 5				
Nickel	[a] 3600	NO	4,220	2,780	2,780
Phenanthrene	[a] 3200	YES	390		390
Potassium	[a] 199,000	YES	162,000		162,000
Pyrene	NA		3,500		3,500

Table C7
Soil Outliers Compared To USL Concentrations
MCRD Parris Island, South Carolina

Parameter	Lowest Outlier	Is Lowest Outlier > USL?	USL	UTL	BTV Selected
Selenium	NA		1,300		1,300
Silver	NA		986		986
Sodium	[a] 218,000	YES	121,000		121,000
Thallium	[a] 682	YES	386		386
Total DDD/DDE/DDT	See Table 4				
Total PAH	See Table 4				
Trichlorofluoromethane	NA		4		4
Vanadium	[a] 16,900	YES	12,100		12,100
Zinc	NA		45,100		45,100

Notes:
All units are micrograms per kilogram
BTV = Background threshold value
USL = ProUCL upper simultaneous limit
UTL = ProUCL upper tolerance limit
NA = Not applicable
a = Identified as containing outlier data by ProUCL; see Appendix B

Appendix C8
Soil Compounds with Three or Fewer Detected Concentrations

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Table C8
Soil Compounds With Three or Fewer Detected Concentrations
MCRD Parris Island, South Carolina

Compound		Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)
2,4'-D	a	1 / 66	20 - 20	20.0	11 - 22
4,4'-DDD	a	1 / 66	1.8 - 1.8	1.8	0.185 - 4.7
Anthracene	a	2 / 66	77 - 590	333.5	37 - 80
Benzaldehyde	a	2 / 66	360 - 800	580.0	0 - 210
Benzo(a)anthracene		3 / 66	150 - 2200	950.0	26 - 82
Benzo(g,h,i)perylene	a	2 / 66	220 - 1100	660.0	28 - 180
Carbazole	a	1 / 66	450 - 450	450.0	46 - 83
Chrysene		3 / 66	180 - 2500	1080.0	36 - 91
Dalapon	a	1 / 66	25 - 25	25.0	4 - 24
Dibenzo(a,h)anthracene	a	1 / 66	550 - 550	550.0	26 - 200
Dichlorodifluoromethane	a	2 / 66	1 - 2.8	1.9	0.62 - 3
Endosulfan Sulfate		3 / 66	2.42 - 13.6	6.8	0.224 - 6.8
Endrin	a	1 / 66	5.45 - 5.45	5.5	0.17 - 9.7
Endrin Aldehyde	a	1 / 66	6.53 - 6.53	6.5	0.234 - 12
Gamma-Chlordane	a	1 / 66	200 - 200	200.0	0.284 - 0.65
Heptachlor	a	1 / 66	1.03 - 1.03	1.0	1.68 - 18
Indeno(1,2,3-CD)pyrene	a	2 / 66	210 - 980	595.0	34 - 180
Methoxychlor	a	2 / 66	2.11 - 32.8	17.5	1.14 - 13
Methyl Acetate	a	2 / 66	1.9 - 3	2.5	0.65 - 1.1
Phenanthrene		3 / 66	92 - 3200	1227.3	40 - 80
Pyrene		3 / 66	280 - 3500	1626.7	37 - 100
Silver		3 / 66	140 - 986	643.3	10 - 123
Thallium		3 / 66	379 - 682	482.3	20 - 417

Notes:

NA = Not applicable

µg/kg = Micrograms per kilograms

a = Indicates compounds with less than three detections for consideration on a case-by-case basis

Soil data are provided in Appendix C2

Soil data that exclude outliers are provided in Appendix C4

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Appendix C9
Sediment Data Summary

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Table C9
Summary Statistics of Sediment Dataset Before Outlier Evaluation
MCRD Parris Island, South Carolina

Compound	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)
Aluminum	11 / 11	888000 - 7090000	3326909.1	NA
Arsenic	6 / 11	990 - 5660	3753.3333	771 - 1340
Barium	11 / 11	2230 - 18600	7453.6364	NA
Beryllium	4 / 11	165 - 416	336.5	106 - 185
Calcium	11 / 11	387000 - 1960000	1055727.3	NA
Carbon Disulfide	11 / 11	2.7 - 1400	632.42727	NA
Chromium	11 / 11	1330 - 13700	6029.0909	NA
Cobalt	8 / 11	261 - 2330	1025.875	160 - 209
Copper	11 / 11	1570 - 23000	6247.2727	NA
Endrin Ketone	4 / 11	12 - 76.5	29.925	0.261 - 0.447
Iron	11 / 11	486000 - 10200000	4087818.2	NA
Lead	11 / 11	1490 - 12700	6022.7273	NA
Magnesium	11 / 11	348000 - 3400000	1709636.4	NA
Manganese	11 / 11	3600 - 67900	21219.091	NA
Mercury	11 / 11	27 - 290	139.63636	NA
Methoxychlor	2 / 11	22.4 - 362	192.2	1.57 - 2.69
Methyl Acetate	1 / 11	3.3 - 3.3	3.3	0.62 - 2.1
Nickel	11 / 11	477 - 3970	1596.6364	NA
Potassium	11 / 11	134000 - 2060000	885272.73	NA
Selenium	3 / 11	1120 - 1670	1470	771 - 1340
Sodium	11 / 11	135000 - 14900000	6332272.7	NA
Vanadium	11 / 11	2480 - 22700	9315.4545	NA
Zinc	11 / 11	3500 - 55200	18878.182	NA

Notes:

NA = Not Applicable

µg/kg = Micrograms per kilograms

Sediment data are provided in Appendix C10

Sediment data that exclude outliers are provided in Appendix C12

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Appendix C10
Sediment Data with Outliers Highlighted

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Appendix C10
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	ALUMINUM	D_ALUMINUM	ARSENIC	D_ARSENIC	BARIUM	D_BARIUM	BERYLLIUM	D_BERYLLIUM	CALCIUM	D_CALCIUM	CARBON DISULFIDE	D_CARBON DISULFIDE	CHROMIUM
CSA-01	888000	1	838	0	2900	1	116	0	565000	1	130	1	1330
CSA-01-D	1050000	1	1010	0	2910	1	140	0	823000	1	34	1	1710
CSA-02	1770000	1	1240	0	7970	1	171	0	1280000	1	650	1	2430
CSA-03	938000	1	771	0	2230	1	106	0	387000	1	2.7	1	2060
CSA-04	4200000	1	2270	1	18600	1	111	0	441000	1	220	1	6760
CSA-05	1680000	1	1340	0	4140	1	185	0	1960000	1	1200	1	3680
CSA-06	6690000	1	3420	1	13000	1	385	1	1050000	1	1400	1	10000
CSA-07	7090000	1	5660	1	10400	1	416	1	1660000	1	1400	1	13500
CSA-08	6560000	1	5050	1	9740	1	380	1	1420000	1	830	1	13700
CSA-09	4210000	1	5130	1	6250	1	165	1	787000	1	850	1	8810
CSA-10	1520000	1	990	1	3850	1	110	0	1240000	1	240	1	2340

Notes:
Units are microgram per kilogram (µg/kg)
Table formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
Table Formatted to allow direct input to ProUCL

Appendix C10
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	D_CHROMIUM	COBALT	D_COBALT	COPPER	D_COPPER	ENDRIN KETONE	D_ENDRIN KETONE	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE
CSA-01	1	173	0	1570	1	12	1	50	0
CSA-01-D	1	209	0	2110	1	18.3	1	63	0
CSA-02	1	384	1	1810	1	12.9	1	72	0
CSA-03	1	160	0	23000	1	0.272	0	48	0
CSA-04	1	360	1	2320	1	0.261	0	46	0
CSA-05	1	462	1	3100	1	0.447	0	79	0
CSA-06	1	1120	1	6280	1	0.335	0	60	0
CSA-07	1	2330	1	12700	1	0.408	0	72	0
CSA-08	1	1900	1	8240	1	0.417	0	74	0
CSA-09	1	1390	1	5930	1	0.348	0	62	0
CSA-10	1	261	1	1660	1	76.5	1	46	0

Notes:
Units are Microgram per Kilogram
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Appendix C10
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	IRON	D_IRON	LEAD	D_LEAD	MAGNESIUM	D_MAGNESIUM	MANGANESE	D_MANGANESE	MERCURY	D_MERCURY	METHOXYCHLOR	D_METHOXYCHLOR	METHYL_ACETATE	D_METHYL_ACETATE
CSA-01	501000	1	5940	1	728000	1	3600	1	74	1	1.71	0	3.3	1
CSA-01-D	486000	1	6510	1	1090000	1	6980	1	190	1	2.13	0	0.99	0
CSA-02	1660000	1	2860	1	1530000	1	6140	1	170	1	2.45	0	1.9	0
CSA-03	889000	1	5720	1	688000	1	4440	1	27	1	1.63	0	0.89	0
CSA-04	3070000	1	3940	1	932000	1	6490	1	290	1	1.57	0	0.62	0
CSA-05	1990000	1	4440	1	1760000	1	15100	1	170	1	2.69	0	2.1	0
CSA-06	6720000	1	12700	1	3400000	1	35400	1	190	1	2.01	0	1.3	0
CSA-07	10200000	1	9470	1	2930000	1	51800	1	220	1	22.4	1	2	0
CSA-08	9260000	1	9000	1	3110000	1	67900	1	120	1	2.51	0	1.9	0
CSA-09	7670000	1	4180	1	2290000	1	27100	1	52	1	2.09	0	1.2	0
CSA-10	2520000	1	1490	1	348000	1	8460	1	33	1	362	1	0.89	0

Notes:
Units are microgram per kilogr
Table formatted to allow direct
Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
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Appendix C10
ProUCL Dataset for Sediment
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	NICKEL	D_NICKEL	POTASSIUM	D_POTASSIUM	SELENIUM	D_SELENIUM	SODIUM	D_SODIUM	THALLIUM	D_THALLIUM	VANADIUM	D_VANADIUM	ZINC	D_ZINC
CSA-01	477	1	225000	1	838	0	3080000	1	491	0	2480	1	3500	1
CSA-01-D	524	1	359000	1	1010	0	5210000	1	593	0	2580	1	4150	1
CSA-02	746	1	411000	1	1240	0	5580000	1	725	0	3730	1	4050	1
CSA-03	705	1	327000	1	771	0	3420000	1	452	0	2970	1	52100	1
CSA-04	1250	1	666000	1	802	0	3710000	1	470	0	10200	1	4870	1
CSA-05	1160	1	406000	1	1340	0	3090000	1	786	0	6060	1	12300	1
CSA-06	2400	1	1750000	1	972	0	14900000	1	570	0	15500	1	19900	1
CSA-07	3970	1	1850000	1	1620	1	9130000	1	707	0	22700	1	55200	1
CSA-08	3490	1	2060000	1	1670	1	11200000	1	718	0	19400	1	27100	1
CSA-09	2140	1	1550000	1	1120	1	10200000	1	623	0	13400	1	19700	1
CSA-10	701	1	134000	1	798	0	135000	1	468	0	3450	1	4790	1

Notes:
Units are microgram per kilogr
Table formatted to allow direct
Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
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Appendix C11
Sediment Data Summary After Removing Outliers

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Table C11
Summary Statistics of Sediment Dataset with Outliers Removed
MCRD Parris Island, South Carolina

Compound	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)	Outliers Removed
Aluminum	11 / 11	888000 - 7090000	3326909.1	NA	0
Arsenic	6 / 11	990 - 5660	3753.3333	771 - 1340	0
Barium	10 / 10	2230 - 13000	6339	NA	1
Beryllium	3 / 10	380 - 416	393.66667	106 - 185	1
Calcium	11 / 11	387000 - 1960000	1055727.3	NA	0
Carbon Disulfide	11 / 11	2.7 - 1400	632.42727	NA	0
Chromium	11 / 11	1330 - 13700	6029.0909	NA	0
Cobalt	8 / 11	261 - 2330	1025.875	160 - 209	0
Copper	10 / 10	1570 - 12700	4572	NA	1
Endrin Ketone	3 / 10	12 - 18.3	14.4	0.261 - 0.447	0
Iron	11 / 11	486000 - 10200000	4087818.2	NA	0
Lead	11 / 11	1490 - 12700	6022.7273	NA	0
Magnesium	11 / 11	348000 - 3400000	1709636.4	NA	0
Manganese	11 / 11	3600 - 67900	21219.091	NA	0
Mercury	11 / 11	27 - 290	139.63636	NA	0
Methoxychlor	2 / 11	22.4 - 362	192.2	1.57 - 2.69	0
Methyl Acetate	1 / 11	3.3 - 3.3	3.3	0.62 - 2.1	0
Nickel	11 / 11	477 - 3970	1596.6364	NA	0
Potassium	11 / 11	134000 - 2060000	885272.73	NA	0
Selenium	2 / 10	1620 - 1670	1645	771 - 1340	1
Sodium	11 / 11	135000 - 14900000	6332272.7	NA	0
Vanadium	11 / 11	2480 - 22700	9315.4545	NA	0
Zinc	9 / 9	3500 - 27100	11151.111	NA	2

Notes:

NA = Not applicable

µg/kg = Micrograms per kilograms

Sediment data are provided in Appendix C10

Sediment data that exclude outliers are provided in Appendix C12

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Appendix C12
Sediment Data after Removing Outliers

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Appendix C12
Sediment Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	ALUMINUM	D_ALUMINUM	ARSENIC	D_ARSENIC	BARIUM	D_BARIUM	BERYLLIUM	D_BERYLLIUM	CALCIUM	D_CALCIUM	CARBON DISULFIDE	D_CARBON DISULFIDE
CSA-01	888000	1	838	0	2900	1	116	0	565000	1	130	1
CSA-01-D	1050000	1	1010	0	2910	1	140	0	823000	1	34	1
CSA-02	1770000	1	1240	0	7970	1	171	0	1280000	1	650	1
CSA-03	938000	1	771	0	2230	1	106	0	387000	1	2.7	1
CSA-04	4200000	1	2270	1			111	0	441000	1	220	1
CSA-05	1680000	1	1340	0	4140	1	185	0	1960000	1	1200	1
CSA-06	6690000	1	3420	1	13000	1	385	1	1050000	1	1400	1
CSA-07	7090000	1	5660	1	10400	1	416	1	1660000	1	1400	1
CSA-08	6560000	1	5050	1	9740	1	380	1	1420000	1	830	1
CSA-09	4210000	1	5130	1	6250	1			787000	1	850	1
CSA-10	1520000	1	990	1	3850	1	110	0	1240000	1	240	1

Notes:
Units are microgram per kilogram (µg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
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Appendix C12
Sediment Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	CHROMIUM	D_CHROMIUM	COBALT	D_COBALT	COPPER	D_COPPER	ENDRIN KETONE	D_ENDRIN KETONE	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE	IRON	D_IRON	LEAD	D_LEAD
CSA-01	1330	1	173	0	1570	1	12	1	50	0	501000	1	5940	1
CSA-01-D	1710	1	209	0	2110	1	18.3	1	63	0	486000	1	6510	1
CSA-02	2430	1	384	1	1810	1	12.9	1	72	0	1660000	1	2860	1
CSA-03	2060	1	160	0			0.272	0	48	0	889000	1	5720	1
CSA-04	6760	1	360	1	2320	1	0.261	0	46	0	3070000	1	3940	1
CSA-05	3680	1	462	1	3100	1	0.447	0	79	0	1990000	1	4440	1
CSA-06	10000	1	1120	1	6280	1	0.335	0	60	0	6720000	1	12700	1
CSA-07	13500	1	2330	1	12700	1	0.408	0	72	0	10200000	1	9470	1
CSA-08	13700	1	1900	1	8240	1	0.417	0	74	0	9260000	1	9000	1
CSA-09	8810	1	1390	1	5930	1	0.348	0	62	0	7670000	1	4180	1
CSA-10	2340	1	261	1	1660	1			46	0	2520000	1	1490	1

Notes:
Units are microgram per kilogram (µg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
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Appendix C12
Sediment Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	MAGNESIUM	D_MAGNESIUM	MANGANESE	D_MANGANESE	MERCURY	D_MERCURY	METHOXYCHLOR	D_METHOXYCHLOR	METHYL_ACETATE	D_METHYL_ACETATE
CSA-01	728000	1	3600	1	74	1	1.71	0	3.3	1
CSA-01-D	1090000	1	6980	1	190	1	2.13	0	0.99	0
CSA-02	1530000	1	6140	1	170	1	2.45	0	1.9	0
CSA-03	688000	1	4440	1	27	1	1.63	0	0.89	0
CSA-04	932000	1	6490	1	290	1	1.57	0	0.62	0
CSA-05	1760000	1	15100	1	170	1	2.69	0	2.1	0
CSA-06	3400000	1	35400	1	190	1	2.01	0	1.3	0
CSA-07	2930000	1	51800	1	220	1	22.4	1	2	0
CSA-08	3110000	1	67900	1	120	1	2.51	0	1.9	0
CSA-09	2290000	1	27100	1	52	1	2.09	0	1.2	0
CSA-10	348000	1	8460	1	33	1	362	1	0.89	0

Notes:
Units are microgram per kilogram (µg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
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Appendix C12
Sediment Data After Removing Outliers
ProUCL Background Evaluation - MCRD Parris Island, South Carolina

SAMPLE	NICKEL	D_NICKEL	POTASSIUM	D_POTASSIUM	SELENIUM	D_SELENIUM	SODIUM	D_SODIUM	THALLIUM	D_THALLIUM	VANADIUM	D_VANADIUM	ZINC	D_ZINC
CSA-01	477	1	225000	1	838	0	3080000	1	491	0	2480	1	3500	1
CSA-01-D	524	1	359000	1	1010	0	5210000	1	593	0	2580	1	4150	1
CSA-02	746	1	411000	1	1240	0	5580000	1	725	0	3730	1	4050	1
CSA-03	705	1	327000	1	771	0	3420000	1	452	0	2970	1		
CSA-04	1250	1	666000	1	802	0	3710000	1	470	0	10200	1	4870	1
CSA-05	1160	1	406000	1	1340	0	3090000	1	786	0	6060	1	12300	1
CSA-06	2400	1	1750000	1	972	0	14900000	1	570	0	15500	1	19900	1
CSA-07	3970	1	1850000	1	1620	1	9130000	1	707	0	22700	1		
CSA-08	3490	1	2060000	1	1670	1	11200000	1	718	0	19400	1	27100	1
CSA-09	2140	1	1550000	1			10200000	1	623	0	13400	1	19700	1
CSA-10	701	1	134000	1	798	0	135000	1	468	0	3450	1	4790	1

Notes:
Units are microgram per kilogram (µg/kg)
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Statistical outlier
Three or less detects
Less than three detects

Notes:
Units are Microgram per Kilogram
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Appendix C13
ProUCL Output, Distribution Recommendations, Sediment UCL Calculations, Outliers Removed

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UCL Statistics for Sediment Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	5/20/2015 10:51:17 AM
From File	C12 Sediment Data after Removing Outliers.xls
Full Precision	ON
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

ALUMINUM

General Statistics

Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	888000.00	Mean	3326909.1
Maximum	7090000.0	Median	1770000.0
SD	2504135.0	Std. Error of Mean	755025.12
Coefficient of Variation	0.7526912	Skewness	0.5634560

Normal GOF Test

Shapiro Wilk Test Statistic	0.8233374	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2783966	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	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	4695362.8	95% Adjusted-CLT UCL (Chen-1995)	4705873.2
		95% Modified-t UCL (Johnson-1978)	4716741.1

Gamma GOF Test

A-D Test Statistic	0.6945147	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7399016	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2435391	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2588717	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.8493010	k star (bias corrected MLE)	1.4055522
Theta hat (MLE)	1799009.0	Theta star (bias corrected MLE)	2366976.5
nu hat (MLE)	40.684621	nu star (bias corrected)	30.922149
MLE Mean (bias corrected)	3326909.1	MLE Sd (bias corrected)	2806192.4
		Approximate Chi Square Value (0.05)	19.219234
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	17.728759

Assuming Gamma Distribution

UCL Statistics for Sediment Data Sets with Non-Detects			
95% Approximate Gamma UCL (use when n>=50)	5352720.0	95% Adjusted Gamma UCL (use when n<50)	5802728.8
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8696512	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2036522	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	13.696727	Mean of logged Data	14.723449
Maximum of Logged Data	15.774196	SD of logged Data	0.8267932
Assuming Lognormal Distribution			
95% H-UCL	7028989.6	90% Chebyshev (MVUE) UCL	5985676.5
95% Chebyshev (MVUE) UCL	7176364.0	97.5% Chebyshev (MVUE) UCL	8828992.0
99% Chebyshev (MVUE) UCL	12075260		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	4568814.9	95% Jackknife UCL	4695362.8
95% Standard Bootstrap UCL	4515937.8	95% Bootstrap-t UCL	4874632.5
95% Hall's Bootstrap UCL	4395984.9	95% Percentile Bootstrap UCL	4548909.1
95% BCA Bootstrap UCL	4654545.5		
90% Chebyshev(Mean, Sd) UCL	5591984.5	95% Chebyshev(Mean, Sd) UCL	6617987.3
97.5% Chebyshev(Mean, Sd) UCL	8042039.5	99% Chebyshev(Mean, Sd) UCL	10839314
Suggested UCL to Use			
95% Adjusted Gamma UCL	5802728.8		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
ARSENIC			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Number of Detects	6.0000000	Number of Non-Detects	5.0000000
Number of Distinct Detects	6.0000000	Number of Distinct Non-Detects	5.0000000
Minimum Detect	990.00000	Minimum Non-Detect	771.00000
Maximum Detect	5660.0000	Maximum Non-Detect	1340.0000
Variance Detects	3431866.7	Percent Non-Detects	45.454545%
Mean Detects	3753.3333	SD Detects	1852.5298

UCL Statistics for Sediment Data Sets with Non-Detects			
Median Detects	4235.0000	CV Detects	0.4935692
Skewness Detects	-0.598381	Kurtosis Detects	-1.329020
Mean of Logged Detects	8.0789699	SD of Logged Detects	0.6714820
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9085437	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2580188	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3617080	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	2417.6364	Standard Error of Mean	636.19419
SD	1924.6639	95% KM (BCA) UCL	3472.0000
95% KM (t) UCL	3570.7136	95% KM (Percentile Bootstrap) UCL	3413.6364
95% KM (z) UCL	3464.0827	95% KM Bootstrap t UCL	3423.0289
90% KM Chebyshev UCL	4326.2189	95% KM Chebyshev UCL	5190.7425
97.5% KM Chebyshev UCL	6390.6678	99% KM Chebyshev UCL	8747.6886
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4416747	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7007095	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2752945	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.3340858	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	3.4596476	k star (bias corrected MLE)	1.8409349
Theta hat (MLE)	1084.8889	Theta star (bias corrected MLE)	2038.8191
nu hat (MLE)	41.515771	nu star (bias corrected)	22.091219
MLE Mean (bias corrected)	3753.3333	MLE Sd (bias corrected)	2766.2913
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	1.5778734	nu hat (KM)	34.713215
Approximate Chi Square Value (34.71, α)	22.235181	Adjusted Chi Square Value (34.71, β)	20.619915
95% Gamma Approximate KM-UCL (use when n>=50)	3774.3759	95% Gamma Adjusted KM-UCL (use when n<50)	4070.0425
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	2171.1468
Maximum	5660.0000	Median	990.00000
SD	2246.1217	CV	1.0345324
k hat (MLE)	0.2844921	k star (bias corrected MLE)	0.2675094
Theta hat (MLE)	7631.6590	Theta star (bias corrected MLE)	8116.1509

UCL Statistics for Sediment Data Sets with Non-Detects			
nu hat (MLE)	6.2588266	nu star (bias corrected)	5.8852072
MLE Mean (bias corrected)	2171.1468	MLE Sd (bias corrected)	4197.7798
		Adjusted Level of Significance (β)	0.0278300
Approximate Chi Square Value (5.89, α)	1.5814865	Adjusted Chi Square Value (5.89, β)	1.2473484
95% Gamma Approximate UCL (use when n>=50)	8079.5179	95% Gamma Adjusted UCL (use when n<50)	10243.849

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.8497740	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2477543	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3617080	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	2361.3154	Mean in Log Scale	7.3723006
SD in Original Scale	2068.7862	SD in Log Scale	0.9479949
95% t UCL (assumes normality of ROS data)	3491.8607	95% Percentile Bootstrap UCL	3387.7127
95% BCA Bootstrap UCL	3443.7750	95% Bootstrap t UCL	3821.7740
95% H-UCL (Log ROS)	5947.4114		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	7.4511162	95% H-UCL (KM -Log)	4874.9501
KM SD (logged)	0.8261571	95% Critical H Value (KM-Log)	2.6774008
KM Standard Error of Mean (logged)	0.2743811		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	2283.5909	Mean in Log Scale	7.2388897
SD in Original Scale	2138.5564	SD in Log Scale	1.0862655
95% t UCL (Assumes normality)	3452.2641	95% H-Stat UCL	7453.5022
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics
Detected Data appear Normal Distributed at 5% Significance Level

Suggested UCL to Use			
95% KM (t) UCL	3570.7136	95% KM (Percentile Bootstrap) UCL	3413.6364

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

BARIUM

General Statistics

UCL Statistics for Sediment Data Sets with Non-Detects			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	1.0000000
Minimum	2230.0000	Mean	6339.0000
Maximum	13000.000	Median	5195.0000
SD	3750.4798	Std. Error of Mean	1186.0059
Coefficient of Variation	0.5916517	Skewness	0.6049274
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9043696	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8420000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2211714	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2801778	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8513.0827	95% Adjusted-CLT UCL (Chen-1995)	8532.2272
		95% Modified-t UCL (Johnson-1978)	8550.8955
Gamma GOF Test			
A-D Test Statistic	0.3738032	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7317707	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1952212	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2683576	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.1467004	k star (bias corrected MLE)	2.2693569
Theta hat (MLE)	2014.4911	Theta star (bias corrected MLE)	2793.3024
nu hat (MLE)	62.934007	nu star (bias corrected)	45.387138
MLE Mean (bias corrected)	6339.0000	MLE Sd (bias corrected)	4207.9382
		Approximate Chi Square Value (0.05)	30.932150
Adjusted Level of Significance	0.0267000	Adjusted Chi Square Value	28.871327
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	9301.2954	95% Adjusted Gamma UCL (use when n<50)	9965.2180
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9330789	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8420000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1618524	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2801778	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	7.7097569	Mean of logged Data	8.5872449
Maximum of Logged Data	9.4727046	SD of logged Data	0.6198300

UCL Statistics for Sediment Data Sets with Non-Detects			
Assuming Lognormal Distribution			
95% H-UCL	10668.476	90% Chebyshev (MVUE) UCL	10192.930
95% Chebyshev (MVUE) UCL	11929.921	97.5% Chebyshev (MVUE) UCL	14340.797
99% Chebyshev (MVUE) UCL	19076.495		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	8289.8060	95% Jackknife UCL	8513.0827
95% Standard Bootstrap UCL	8208.3833	95% Bootstrap-t UCL	8969.5615
95% Hall's Bootstrap UCL	8271.4921	95% Percentile Bootstrap UCL	8344.0000
95% BCA Bootstrap UCL	8441.0000		
90% Chebyshev(Mean, Sd) UCL	9897.0176	95% Chebyshev(Mean, Sd) UCL	11508.680
97.5% Chebyshev(Mean, Sd) UCL	13745.604	99% Chebyshev(Mean, Sd) UCL	18139.609
Suggested UCL to Use			
95% Student's-t UCL	8513.0827		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
BERYLLIUM			
General Statistics			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	1.0000000
Number of Detects	3.0000000	Number of Non-Detects	7.0000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	7.0000000
Minimum Detect	380.00000	Minimum Non-Detect	106.00000
Maximum Detect	416.00000	Maximum Non-Detect	185.00000
Variance Detects	380.33333	Percent Non-Detects	70.000000%
Mean Detects	393.66667	SD Detects	19.502137
Median Detects	385.00000	CV Detects	0.0495397
Skewness Detects	1.6048490	Kurtosis Detects	N/A
Mean of Logged Detects	5.9746999	SD of Logged Detects	0.0489233
Warning: Data set has only 3 Detected Values.			
This is not enough to compute meaningful or reliable statistics and estimates.			
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8518680	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level	

UCL Statistics for Sediment Data Sets with Non-Detects			
Lilliefors Test Statistic	0.3382884	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	192.30000	Standard Error of Mean	51.167387
SD	132.11363	95% KM (BCA) UCL	N/A
95% KM (t) UCL	286.09560	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	276.46286	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	345.80216	95% KM Chebyshev UCL	415.33347
97.5% KM Chebyshev UCL	511.84023	99% KM Chebyshev UCL	701.40907
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	621.61007	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.6333016	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3729.6604	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	2.1186702	nu hat (KM)	42.373403
		Adjusted Level of Significance (β)	0.0267000
Approximate Chi Square Value (42.37, α)	28.450307	Adjusted Chi Square Value (42.37, β)	26.481216
95% Gamma Approximate KM-UCL (use when n>=50)	286.40835	95% Gamma Adjusted KM-UCL (use when n<50)	307.70511
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8557213	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.3361826	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	343.63263	Mean in Log Scale	5.8350078
SD in Original Scale	35.729764	SD in Log Scale	0.0991172
95% t UCL (assumes normality of ROS data)	364.34450	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	N/A		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	5.0568174	95% H-UCL (KM -Log)	302.66296
KM SD (logged)	0.6012934	95% Critical H Value (KM-Log)	2.3700190
KM Standard Error of Mean (logged)	0.2328799		
DL/2 Statistics			

UCL Statistics for Sediment Data Sets with Non-Detects			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	165.05000	Mean in Log Scale	4.7202771
SD in Original Scale	158.57376	SD in Log Scale	0.8857413
95% t UCL (Assumes normality)	256.97223	95% H-Stat UCL	388.00473
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	286.09560	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

CALCIUM

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	387000.00	Mean	1055727.3
Maximum	1960000.0	Median	1050000.0
SD	509127.90	Std. Error of Mean	153507.84
Coefficient of Variation	0.4822532	Skewness	0.3189743

Normal GOF Test		
Shapiro Wilk Test Statistic	0.9603918	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.1307493	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level
Data appear Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1333954.3	95% Adjusted-CLT UCL (Chen-1995)	1324000.2
		95% Modified-t UCL (Johnson-1978)	1336414.8

Gamma GOF Test		
A-D Test Statistic	0.2235493	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7322510	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.1467703	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2563364	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

UCL Statistics for Sediment Data Sets with Non-Detects			
Gamma Statistics			
k hat (MLE)	4.2991874	k star (bias corrected MLE)	3.1872878
Theta hat (MLE)	245564.38	Theta star (bias corrected MLE)	331230.60
nu hat (MLE)	94.582123	nu star (bias corrected)	70.120332
MLE Mean (bias corrected)	1055727.3	MLE Sd (bias corrected)	591345.23
		Approximate Chi Square Value (0.05)	51.842859
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	49.288738
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	1427929.5	95% Adjusted Gamma UCL (use when n<50)	1501924.2
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9481823	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1545033	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	12.866180	Mean of logged Data	13.748955
Maximum of Logged Data	14.488455	SD of logged Data	0.5372468
Assuming Lognormal Distribution			
95% H-UCL	1577532.1	90% Chebyshev (MVUE) UCL	1595299.5
95% Chebyshev (MVUE) UCL	1835378.5	97.5% Chebyshev (MVUE) UCL	2168598.9
99% Chebyshev (MVUE) UCL	2823145.9		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1308225.2	95% Jackknife UCL	1333954.3
95% Standard Bootstrap UCL	1302271.1	95% Bootstrap-t UCL	1361512.7
95% Hall's Bootstrap UCL	1318937.5	95% Percentile Bootstrap UCL	1306818.2
95% BCA Bootstrap UCL	1302818.2		
90% Chebyshev(Mean, Sd) UCL	1516250.8	95% Chebyshev(Mean, Sd) UCL	1724852.4
97.5% Chebyshev(Mean, Sd) UCL	2014383.4	99% Chebyshev(Mean, Sd) UCL	2583111.0
Suggested UCL to Use			
95% Student's-t UCL	1333954.3		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			

UCL Statistics for Sediment Data Sets with Non-Detects			
CARBON DISULFIDE			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	0
Minimum	2.7000000	Mean	632.42727
Maximum	1400.0000	Median	650.00000
SD	540.21815	Std. Error of Mean	162.88190
Coefficient of Variation	0.8541981	Skewness	0.2975953
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8863403	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2207559	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	927.64439	95% Adjusted-CLT UCL (Chen-1995)	915.96063
		95% Modified-t UCL (Johnson-1978)	930.08024
Gamma GOF Test			
A-D Test Statistic	0.4673224	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7645670	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2080672	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2653941	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.7224425	k star (bias corrected MLE)	0.5860188
Theta hat (MLE)	875.40149	Theta star (bias corrected MLE)	1079.1928
nu hat (MLE)	15.893736	nu star (bias corrected)	12.892414
MLE Mean (bias corrected)	632.42727	MLE Sd (bias corrected)	826.14221
		Approximate Chi Square Value (0.05)	5.8204246
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	5.0666482
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	1400.8453	95% Adjusted Gamma UCL (use when n<50)	1609.2521
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8204002	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2179339	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			

UCL Statistics for Sediment Data Sets with Non-Detects			
Lognormal Statistics			
Minimum of Logged Data	0.9932518	Mean of logged Data	5.6166890
Maximum of Logged Data	7.2442275	SD of logged Data	1.9255630
Assuming Lognormal Distribution			
95% H-UCL	36509.005	90% Chebyshev (MVUE) UCL	3522.7650
95% Chebyshev (MVUE) UCL	4558.4622	97.5% Chebyshev (MVUE) UCL	5995.9698
99% Chebyshev (MVUE) UCL	8819.6751		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	900.34416	95% Jackknife UCL	927.64439
95% Standard Bootstrap UCL	885.54704	95% Bootstrap-t UCL	944.67418
95% Hall's Bootstrap UCL	874.12135	95% Percentile Bootstrap UCL	892.97273
95% BCA Bootstrap UCL	894.54545		
90% Chebyshev(Mean, Sd) UCL	1121.0730	95% Chebyshev(Mean, Sd) UCL	1342.4130
97.5% Chebyshev(Mean, Sd) UCL	1649.6244	99% Chebyshev(Mean, Sd) UCL	2253.0817
Suggested UCL to Use			
95% Student's-t UCL	927.64439		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
CHROMIUM			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	1330.0000	Mean	6029.0909
Maximum	13700.000	Median	3680.0000
SD	4767.2203	Std. Error of Mean	1437.3710
Coefficient of Variation	0.7907030	Skewness	0.6726091
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8448760	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2343631	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			

UCL Statistics for Sediment Data Sets with Non-Detects			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	8634.2700	95% Adjusted-CLT UCL (Chen-1995)	8704.8254
		95% Modified-t UCL (Johnson-1978)	8682.8529
Gamma GOF Test			
A-D Test Statistic	0.5686983	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7409558	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2287779	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.2592562	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.6890951	k star (bias corrected MLE)	1.2890388
Theta hat (MLE)	3569.4207	Theta star (bias corrected MLE)	4677.1988
nu hat (MLE)	37.160091	nu star (bias corrected)	28.358854
MLE Mean (bias corrected)	6029.0909	MLE Sd (bias corrected)	5310.2973
		Approximate Chi Square Value (0.05)	17.207664
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	15.805849
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	9936.1605	95% Adjusted Gamma UCL (use when n<50)	10817.395
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8990618	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2036408	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	7.1929342	Mean of logged Data	8.3800202
Maximum of Logged Data	9.5251511	SD of logged Data	0.8700626
Assuming Lognormal Distribution			
95% H-UCL	13584.086	90% Chebyshev (MVUE) UCL	11129.139
95% Chebyshev (MVUE) UCL	13410.479	97.5% Chebyshev (MVUE) UCL	16576.890
99% Chebyshev (MVUE) UCL	22796.691		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	8393.3558	95% Jackknife UCL	8634.2700
95% Standard Bootstrap UCL	8264.5209	95% Bootstrap-t UCL	9279.2022
95% Hall's Bootstrap UCL	8398.6041	95% Percentile Bootstrap UCL	8400.0000
95% BCA Bootstrap UCL	8376.3636		

UCL Statistics for Sediment Data Sets with Non-Detects			
90% Chebyshev(Mean, Sd) UCL	10341.204	95% Chebyshev(Mean, Sd) UCL	12294.446
97.5% Chebyshev(Mean, Sd) UCL	15005.470	99% Chebyshev(Mean, Sd) UCL	20330.752

Suggested UCL to Use	
95% Student's-t UCL	8634.2700

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

COBALT

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Number of Detects	8.0000000	Number of Non-Detects	3.0000000
Number of Distinct Detects	8.0000000	Number of Distinct Non-Detects	3.0000000
Minimum Detect	261.00000	Minimum Non-Detect	160.00000
Maximum Detect	2330.0000	Maximum Non-Detect	209.00000
Variance Detects	623523.55	Percent Non-Detects	27.272727%
Mean Detects	1025.8750	SD Detects	789.63508
Median Detects	791.00000	CV Detects	0.7697186
Skewness Detects	0.6764540	Kurtosis Detects	-1.104651
Mean of Logged Detects	6.6372759	SD of Logged Detects	0.8471697

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8726977	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8180000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2624160	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3132483	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	789.72727	Standard Error of Mean	238.06501
SD	738.57727	95% KM (BCA) UCL	1183.7273
95% KM (t) UCL	1221.2109	95% KM (Percentile Bootstrap) UCL	1181.9091
95% KM (z) UCL	1181.3094	95% KM Bootstrap t UCL	1394.3129
90% KM Chebyshev UCL	1503.9223	95% KM Chebyshev UCL	1827.4286
97.5% KM Chebyshev UCL	2276.4428	99% KM Chebyshev UCL	3158.4442

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	0.4656078	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.7254104	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2562435	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.2979261	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

UCL Statistics for Sediment Data Sets with Non-Detects			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.8381619	k star (bias corrected MLE)	1.2321845
Theta hat (MLE)	558.09829	Theta star (bias corrected MLE)	832.56606
nu hat (MLE)	29.410590	nu star (bias corrected)	19.714952
MLE Mean (bias corrected)	1025.8750	MLE Sd (bias corrected)	924.18002
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	1.1433058	nu hat (KM)	25.152727
Approximate Chi Square Value (25.15, α)	14.728564	Adjusted Chi Square Value (25.15, β)	13.443333
95% Gamma Approximate KM-UCL (use when n>=50)	1348.6579	95% Gamma Adjusted KM-UCL (use when n<50)	1477.5945
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	746.09364
Maximum	2330.0000	Median	384.00000
SD	816.13774	CV	1.0938811
k hat (MLE)	0.2356000	k star (bias corrected MLE)	0.2319515
Theta hat (MLE)	3166.7815	Theta star (bias corrected MLE)	3216.5933
nu hat (MLE)	5.1831995	nu star (bias corrected)	5.1029330
MLE Mean (bias corrected)	746.09364	MLE Sd (bias corrected)	1549.1545
		Adjusted Level of Significance (β)	0.0278300
Approximate Chi Square Value (5.10, α)	1.2000365	Adjusted Chi Square Value (5.10, β)	0.9229431
95% Gamma Approximate UCL (use when n>=50)	3172.6251	95% Gamma Adjusted UCL (use when n<50)	4125.1359
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8988992	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8180000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2231485	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3132483	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	772.56872	Mean in Log Scale	6.0749980
SD in Original Scale	790.36770	SD in Log Scale	1.1957341
95% t UCL (assumes normality of ROS data)	1204.4870	95% Percentile Bootstrap UCL	1175.2805
95% BCA Bootstrap UCL	1215.9091	95% Bootstrap t UCL	1364.7092
95% H-UCL (Log ROS)	3199.1857		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	6.2112481	95% H-UCL (KM -Log)	1965.3953
KM SD (logged)	0.9699047	95% Critical H Value (KM-Log)	2.9403690
KM Standard Error of Mean (logged)	0.3126286		
DL/2 Statistics			

UCL Statistics for Sediment Data Sets with Non-Detects			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	770.72727	Mean in Log Scale	6.0535969
SD in Original Scale	792.12358	SD in Log Scale	1.2269853
95% t UCL (Assumes normality)	1203.6051	95% H-Stat UCL	3448.5008
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	1221.2109	95% KM (Percentile Bootstrap) UCL	1181.9091

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

COPPER

General Statistics			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	1.0000000
Minimum	1570.0000	Mean	4572.0000
Maximum	12700.000	Median	2710.0000
SD	3692.3368	Std. Error of Mean	1167.6194
Coefficient of Variation	0.8075977	Skewness	1.3559677

Normal GOF Test		
Shapiro Wilk Test Statistic	0.8164139	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8420000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2549294	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2801778	Data appear Normal at 5% Significance Level
Data appear Approximate Normal at 5% Significance Level		

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6712.3783	95% Adjusted-CLT UCL (Chen-1995)	7027.5351
		95% Modified-t UCL (Johnson-1978)	6795.8231

Gamma GOF Test		
A-D Test Statistic	0.5884400	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7354775	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2330329	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2697690	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

UCL Statistics for Sediment Data Sets with Non-Detects			
Gamma Statistics			
k hat (MLE)	2.0301405	k star (bias corrected MLE)	1.4877650
Theta hat (MLE)	2252.0608	Theta star (bias corrected MLE)	3073.0659
nu hat (MLE)	40.602811	nu star (bias corrected)	29.755301
MLE Mean (bias corrected)	4572.0000	MLE Sd (bias corrected)	3748.3406
		Approximate Chi Square Value (0.05)	18.300545
Adjusted Level of Significance	0.0267000	Adjusted Chi Square Value	16.755894
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	7433.7258	95% Adjusted Gamma UCL (use when n<50)	8119.0078
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8928944	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8420000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2082863	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2801778	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	7.3588309	Mean of logged Data	8.1616427
Maximum of Logged Data	9.4493573	SD of logged Data	0.7518807
Assuming Lognormal Distribution			
95% H-UCL	8969.6242	90% Chebyshev (MVUE) UCL	7809.2652
95% Chebyshev (MVUE) UCL	9311.0805	97.5% Chebyshev (MVUE) UCL	11395.542
99% Chebyshev (MVUE) UCL	15490.063		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	6492.5630	95% Jackknife UCL	6712.3783
95% Standard Bootstrap UCL	6377.2402	95% Bootstrap-t UCL	8075.6154
95% Hall's Bootstrap UCL	7442.1336	95% Percentile Bootstrap UCL	6491.0000
95% BCA Bootstrap UCL	6947.0000		
90% Chebyshev(Mean, Sd) UCL	8074.8583	95% Chebyshev(Mean, Sd) UCL	9661.5351
97.5% Chebyshev(Mean, Sd) UCL	11863.781	99% Chebyshev(Mean, Sd) UCL	16189.667
Suggested UCL to Use			
95% Student's-t UCL	6712.3783		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
ENDRIN KETONE			

UCL Statistics for Sediment Data Sets with Non-Detects			
General Statistics			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
Number of Detects	3.0000000	Number of Non-Detects	7.0000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	7.0000000
Minimum Detect	12.000000	Minimum Non-Detect	0.2610000
Maximum Detect	18.300000	Maximum Non-Detect	0.4470000
Variance Detects	11.610000	Percent Non-Detects	70.000000%
Mean Detects	14.400000	SD Detects	3.4073450
Median Detects	12.900000	CV Detects	0.2366212
Skewness Detects	1.5970970	Kurtosis Detects	N/A
Mean of Logged Detects	2.6496783	SD of Logged Detects	0.2256772
Warning: Data set has only 3 Detected Values.			
This is not enough to compute meaningful or reliable statistics and estimates.			
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.8546348	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3367798	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	4.5027000	Standard Error of Mean	2.5778880
SD	6.6560782	95% KM (BCA) UCL	N/A
95% KM (t) UCL	9.2282599	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	8.7429485	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	12.236364	95% KM Chebyshev UCL	15.739453
97.5% KM Chebyshev UCL	20.601605	99% KM Chebyshev UCL	30.152362
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	28.655928	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.5025138	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	171.93557	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.4576244	nu hat (KM)	9.1524884
		Adjusted Level of Significance (β)	0.0267000
Approximate Chi Square Value (9.15, α)	3.4193222	Adjusted Chi Square Value (9.15, β)	2.8382706
95% Gamma Approximate KM-UCL (use when n>=50)	12.052362	95% Gamma Adjusted KM-UCL (use when n<50)	14.519726

UCL Statistics for Sediment Data Sets with Non-Detects			
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.8741170	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.3256391	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	8.2375903	Mean in Log Scale	2.0004097
SD in Original Scale	4.5457093	SD in Log Scale	0.4604952
95% t UCL (assumes normality of ROS data)	10.872653	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	11.460563		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	-0.145361	95% H-UCL (KM -Log)	97.826856
KM SD (logged)	1.8325640	95% Critical H Value (KM-Log)	4.9920461
KM Standard Error of Mean (logged)	0.7097490		
DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	4.4444000	Mean in Log Scale	-0.427371
SD in Original Scale	7.0553525	SD in Log Scale	2.1329580
95% t UCL (Assumes normality)	8.5342553	95% H-Stat UCL	369.93872
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	9.2282599	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.			

IRON

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	486000.00	Mean	4087818.2
Maximum	10200000	Median	2520000.0
SD	3656919.3	Std. Error of Mean	1102602.6

UCL Statistics for Sediment Data Sets with Non-Detects			
Coefficient of Variation	0.8945895	Skewness	0.6919233
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8521379	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2459828	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	6086242.6	95% Adjusted-CLT UCL (Chen-1995)	6147226.4
		95% Modified-t UCL (Johnson-1978)	6124580.6
Gamma GOF Test			
A-D Test Statistic	0.3860060	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7482024	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1759691	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2614241	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.1790167	k star (bias corrected MLE)	0.9180728
Theta hat (MLE)	3467141.8	Theta star (bias corrected MLE)	4452608.0
nu hat (MLE)	25.938368	nu star (bias corrected)	20.197601
MLE Mean (bias corrected)	4087818.2	MLE Sd (bias corrected)	4266315.9
		Approximate Chi Square Value (0.05)	10.996941
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	9.9070881
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	7507917.2	95% Adjusted Gamma UCL (use when n<50)	8333843.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9171001	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1725030	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	13.093964	Mean of logged Data	14.742877
Maximum of Logged Data	16.137898	SD of logged Data	1.1190236
Assuming Lognormal Distribution			
95% H-UCL	14833986	90% Chebyshev (MVUE) UCL	9064541.5
95% Chebyshev (MVUE) UCL	11196209	97.5% Chebyshev (MVUE) UCL	14154881
99% Chebyshev (MVUE) UCL	19966619		

UCL Statistics for Sediment Data Sets with Non-Detects			
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	5901438.1	95% Jackknife UCL	6086242.6
95% Standard Bootstrap UCL	5811376.9	95% Bootstrap-t UCL	6427913.6
95% Hall's Bootstrap UCL	5652545.0	95% Percentile Bootstrap UCL	5812818.2
95% BCA Bootstrap UCL	6102727.3		
90% Chebyshev(Mean, Sd) UCL	7395626.1	95% Chebyshev(Mean, Sd) UCL	8893951.7
97.5% Chebyshev(Mean, Sd) UCL	10973570	99% Chebyshev(Mean, Sd) UCL	15058576
Suggested UCL to Use			
95% Student's-t UCL	6086242.6		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
LEAD			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	1490.0000	Mean	6022.7273
Maximum	12700.000	Median	5720.0000
SD	3262.7690	Std. Error of Mean	983.76188
Coefficient of Variation	0.5417428	Skewness	0.7781310
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9488995	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1679141	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	7805.7575	95% Adjusted-CLT UCL (Chen-1995)	7887.4907
		95% Modified-t UCL (Johnson-1978)	7844.2251
Gamma GOF Test			
A-D Test Statistic	0.1633822	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7330228	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1098045	**Kolmogrov-Smirnoff Gamma GOF Test**	

UCL Statistics for Sediment Data Sets with Non-Detects			
5% K-S Critical Value	0.2567114	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.5463347	k star (bias corrected MLE)	2.6397586
Theta hat (MLE)	1698.2964	Theta star (bias corrected MLE)	2281.5447
nu hat (MLE)	78.019363	nu star (bias corrected)	58.074688
MLE Mean (bias corrected)	6022.7273	MLE Sd (bias corrected)	3706.9019
		Approximate Chi Square Value (0.05)	41.555231
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	39.286390
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	8416.9429	95% Adjusted Gamma UCL (use when n<50)	8903.0325
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9674709	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1405607	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	7.3065314	Mean of logged Data	8.5557295
Maximum of Logged Data	9.4493573	SD of logged Data	0.6003457
Assuming Lognormal Distribution			
95% H-UCL	9656.0108	90% Chebyshev (MVUE) UCL	9520.5417
95% Chebyshev (MVUE) UCL	11066.224	97.5% Chebyshev (MVUE) UCL	13211.571
99% Chebyshev (MVUE) UCL	17425.689		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	7640.8716	95% Jackknife UCL	7805.7575
95% Standard Bootstrap UCL	7564.9707	95% Bootstrap-t UCL	8260.1838
95% Hall's Bootstrap UCL	8215.7227	95% Percentile Bootstrap UCL	7680.9091
95% BCA Bootstrap UCL	7842.7273		
90% Chebyshev(Mean, Sd) UCL	8974.0129	95% Chebyshev(Mean, Sd) UCL	10310.846
97.5% Chebyshev(Mean, Sd) UCL	12166.318	99% Chebyshev(Mean, Sd) UCL	15811.034
Suggested UCL to Use			
95% Student's-t UCL	7805.7575		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.			

UCL Statistics for Sediment Data Sets with Non-Detects			
For additional insight the user may want to consult a statistician.			
MAGNESIUM			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	348000.00	Mean	1709636.4
Maximum	3400000.0	Median	1530000.0
SD	1073747.4	Std. Error of Mean	323747.02
Coefficient of Variation	0.6280560	Skewness	0.4283252
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9164759	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1726022	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2296415.3	95% Adjusted-CLT UCL (Chen-1995)	2286827.7
		95% Modified-t UCL (Johnson-1978)	2303383.6
Gamma GOF Test			
A-D Test Statistic	0.2664805	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7363931	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1441796	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2578002	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.4669665	k star (bias corrected MLE)	1.8547635
Theta hat (MLE)	693011.58	Theta star (bias corrected MLE)	921754.36
nu hat (MLE)	54.273263	nu star (bias corrected)	40.804797
MLE Mean (bias corrected)	1709636.4	MLE Sd (bias corrected)	1255334.5
		Approximate Chi Square Value (0.05)	27.166111
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	25.363576
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	2567955.5	95% Adjusted Gamma UCL (use when n<50)	2750454.6
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9458643	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1213088	**Lilliefors Lognormal GOF Test**	

UCL Statistics for Sediment Data Sets with Non-Detects			
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	12.759958	Mean of logged Data	14.135630
Maximum of Logged Data	15.039286	SD of logged Data	0.7326336
Assuming Lognormal Distribution			
95% H-UCL	3228475.6	90% Chebyshev (MVUE) UCL	2954727.9
95% Chebyshev (MVUE) UCL	3500635.8	97.5% Chebyshev (MVUE) UCL	4258334.7
99% Chebyshev (MVUE) UCL	5746687.5		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	2242152.8	95% Jackknife UCL	2296415.3
95% Standard Bootstrap UCL	2213043.5	95% Bootstrap-t UCL	2336749.2
95% Hall's Bootstrap UCL	2220452.2	95% Percentile Bootstrap UCL	2234363.6
95% BCA Bootstrap UCL	2211090.9		
90% Chebyshev(Mean, Sd) UCL	2680877.4	95% Chebyshev(Mean, Sd) UCL	3120816.9
97.5% Chebyshev(Mean, Sd) UCL	3731435.8	99% Chebyshev(Mean, Sd) UCL	4930878.5
Suggested UCL to Use			
95% Student's-t UCL	2296415.3		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			

MANGANESE

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	3600.0000	Mean	21219.091
Maximum	67900.000	Median	8460.0000
SD	21884.395	Std. Error of Mean	6598.3933
Coefficient of Variation	1.0313540	Skewness	1.2986720
Normal GOF Test			
Shapiro Wilk Test Statistic	0.7984014	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2655154	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	

UCL Statistics for Sediment Data Sets with Non-Detects			
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	33178.422	95% Adjusted-CLT UCL (Chen-1995)	34833.198
		95% Modified-t UCL (Johnson-1978)	33609.038
Gamma GOF Test			
A-D Test Statistic	0.6055168	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7483349	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2493813	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.2614619	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.1719308	k star (bias corrected MLE)	0.9129194
Theta hat (MLE)	18106.095	Theta star (bias corrected MLE)	23243.116
nu hat (MLE)	25.782478	nu star (bias corrected)	20.084226
MLE Mean (bias corrected)	21219.091	MLE Sd (bias corrected)	22208.057
		Approximate Chi Square Value (0.05)	10.913255
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	9.8281278
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	39050.588	95% Adjusted Gamma UCL (use when n<50)	43362.178
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9119437	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2091663	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	8.1886891	Mean of logged Data	9.4787953
Maximum of Logged Data	11.125791	SD of logged Data	1.0309411
Assuming Lognormal Distribution			
95% H-UCL	60297.533	90% Chebyshev (MVUE) UCL	41447.627
95% Chebyshev (MVUE) UCL	50787.572	97.5% Chebyshev (MVUE) UCL	63751.054
99% Chebyshev (MVUE) UCL	89215.304		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	32072.482	95% Jackknife UCL	33178.422
95% Standard Bootstrap UCL	31759.866	95% Bootstrap-t UCL	41645.345

UCL Statistics for Sediment Data Sets with Non-Detects			
95% Hall's Bootstrap UCL	36014.741	95% Percentile Bootstrap UCL	31935.455
95% BCA Bootstrap UCL	34009.091		
90% Chebyshev(Mean, Sd) UCL	41014.271	95% Chebyshev(Mean, Sd) UCL	49980.820
97.5% Chebyshev(Mean, Sd) UCL	62426.044	99% Chebyshev(Mean, Sd) UCL	86872.275
Suggested UCL to Use			
95% Student's-t UCL	33178.422		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

MERCURY

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	9.0000000
		Number of Missing Observations	0
Minimum	27.000000	Mean	139.63636
Maximum	290.00000	Median	170.00000
SD	85.097912	Std. Error of Mean	25.657986
Coefficient of Variation	0.6094251	Skewness	0.1239760
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9373426	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1848369	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	186.14047	95% Adjusted-CLT UCL (Chen-1995)	182.86481
		95% Modified-t UCL (Johnson-1978)	186.30032
Gamma GOF Test			
A-D Test Statistic	0.4982573	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7377459	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2456728	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2581817	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.2159741	k star (bias corrected MLE)	1.6722236
Theta hat (MLE)	63.013537	Theta star (bias corrected MLE)	83.503407
nu hat (MLE)	48.751429	nu star (bias corrected)	36.788918

UCL Statistics for Sediment Data Sets with Non-Detects			
MLE Mean (bias corrected)	139.63636	MLE Sd (bias corrected)	107.98200
		Approximate Chi Square Value (0.05)	23.904608
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	22.223842
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	214.89876	95% Adjusted Gamma UCL (use when n<50)	231.15134
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8876902	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2517820	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	3.2958369	Mean of logged Data	4.6967544
Maximum of Logged Data	5.6698809	SD of logged Data	0.8090184
Assuming Lognormal Distribution			
95% H-UCL	299.26991	90% Chebyshev (MVUE) UCL	258.66128
95% Chebyshev (MVUE) UCL	309.45009	97.5% Chebyshev (MVUE) UCL	379.94300
99% Chebyshev (MVUE) UCL	518.41265		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	181.83999	95% Jackknife UCL	186.14047
95% Standard Bootstrap UCL	178.91000	95% Bootstrap-t UCL	190.23639
95% Hall's Bootstrap UCL	182.82833	95% Percentile Bootstrap UCL	180.27273
95% BCA Bootstrap UCL	182.81818		
90% Chebyshev(Mean, Sd) UCL	216.61032	95% Chebyshev(Mean, Sd) UCL	251.47693
97.5% Chebyshev(Mean, Sd) UCL	299.87043	99% Chebyshev(Mean, Sd) UCL	394.93010
Suggested UCL to Use			
95% Student's-t UCL	186.14047		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
METHOXYCHLOR			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Number of Detects	2.0000000	Number of Non-Detects	9.0000000

UCL Statistics for Sediment Data Sets with Non-Detects			
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	9.0000000
Minimum Detect	22.400000	Minimum Non-Detect	1.5700000
Maximum Detect	362.00000	Maximum Non-Detect	2.6900000
Variance Detects	57664.080	Percent Non-Detects	81.818182%
Mean Detects	192.20000	SD Detects	240.13346
Median Detects	192.20000	CV Detects	1.2493937
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	4.5003526	SD of Logged Detects	1.9675835

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	36.230000	Standard Error of Mean	44.000226
SD	103.18968	95% KM (BCA) UCL	N/A
95% KM (t) UCL	115.97870	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	108.60393	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	168.23068	95% KM Chebyshev UCL	228.02254
97.5% KM Chebyshev UCL	311.01132	99% KM Chebyshev UCL	474.02672

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.7847737	k star (bias corrected MLE)	N/A
Theta hat (MLE)	244.91136	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.1390948	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.1232719	nu hat (KM)	2.7119823
		Adjusted Level of Significance (β)	0.0278300
Approximate Chi Square Value (2.71, α)	0.2924682	Adjusted Chi Square Value (2.71, β)	0.2048696
95% Gamma Approximate KM-UCL (use when n>=50)	335.95150	95% Gamma Adjusted KM-UCL (use when n<50)	479.59834

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	34.946120	Mean in Log Scale	-5.002013
SD in Original Scale	108.67944	SD in Log Scale	4.7391177
95% t UCL (assumes normality of ROS data)	94.337002	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A

UCL Statistics for Sediment Data Sets with Non-Detects			
95% H-UCL (Log ROS)	1.918E+10		

DL/2 Statistics			
DL/2 Normal		DL/2 Log-Transformed	
Mean in Original Scale	35.799545	Mean in Log Scale	0.8396238
SD in Original Scale	108.37814	SD in Log Scale	1.9218382
95% t UCL (Assumes normality)	95.025770	95% H-Stat UCL	301.88809

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use						
97.5% KM (Chebyshev) UCL	311.01132					

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

METHYL_ACETATE

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	9.0000000
Number of Detects	1.0000000	Number of Non-Detects	10.000000
Number of Distinct Detects	1.0000000	Number of Distinct Non-Detects	8.0000000

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable METHYL_ACETATE was not processed!

NICKEL

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	477.00000	Mean	1596.6364
Maximum	3970.0000	Median	1160.0000
SD	1232.6404	Std. Error of Mean	371.65505
Coefficient of Variation	0.7720232	Skewness	1.0460842

Normal GOF Test		
Shapiro Wilk Test Statistic	0.8358625	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level

UCL Statistics for Sediment Data Sets with Non-Detects			
Lilliefors Test Statistic	0.2470907	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	2270.2467	95% Adjusted-CLT UCL (Chen-1995)	2333.2083
		95% Modified-t UCL (Johnson-1978)	2289.7838
Gamma GOF Test			
A-D Test Statistic	0.5204542	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7386347	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2191133	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2584324	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.0510719	k star (bias corrected MLE)	1.5522947
Theta hat (MLE)	778.43998	Theta star (bias corrected MLE)	1028.5652
nu hat (MLE)	45.123582	nu star (bias corrected)	34.150484
MLE Mean (bias corrected)	1596.6364	MLE Sd (bias corrected)	1281.5009
		Approximate Chi Square Value (0.05)	21.784696
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	20.187517
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	2502.9453	95% Adjusted Gamma UCL (use when n<50)	2700.9713
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9154410	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1993451	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	6.1675165	Mean of logged Data	7.1124979
Maximum of Logged Data	8.2865214	SD of logged Data	0.7562470
Assuming Lognormal Distribution			
95% H-UCL	3011.2321	90% Chebyshev (MVUE) UCL	2710.7064
95% Chebyshev (MVUE) UCL	3221.5117	97.5% Chebyshev (MVUE) UCL	3930.4898
99% Chebyshev (MVUE) UCL	5323.1399		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			

UCL Statistics for Sediment Data Sets with Non-Detects			
95% CLT UCL	2207.9545	95% Jackknife UCL	2270.2467
95% Standard Bootstrap UCL	2187.0910	95% Bootstrap-t UCL	2570.9564
95% Hall's Bootstrap UCL	2387.0559	95% Percentile Bootstrap UCL	2228.0000
95% BCA Bootstrap UCL	2299.0909		
90% Chebyshev(Mean, Sd) UCL	2711.6015	95% Chebyshev(Mean, Sd) UCL	3216.6432
97.5% Chebyshev(Mean, Sd) UCL	3917.6214	99% Chebyshev(Mean, Sd) UCL	5294.5574

Suggested UCL to Use							
95% Student's-t UCL	2270.2467						

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and 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.

POTASSIUM

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	134000.00	Mean	885272.73
Maximum	2060000.0	Median	411000.00
SD	747797.98	Std. Error of Mean	225469.57
Coefficient of Variation	0.8447092	Skewness	0.6431156

Normal GOF Test		
Shapiro Wilk Test Statistic	0.8092631	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2824878	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	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	1293927.6	95% Adjusted-CLT UCL (Chen-1995)	1302852.7
		95% Modified-t UCL (Johnson-1978)	1301214.2

Gamma GOF Test		
A-D Test Statistic	0.6798598	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7428545	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2481272	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2598969	Detected data appear Gamma Distributed at 5% Significance Level
Detected data appear Gamma Distributed at 5% Significance Level		

Gamma Statistics			
k hat (MLE)	1.4650009	k star (bias corrected MLE)	1.1260613

UCL Statistics for Sediment Data Sets with Non-Detects			
Theta hat (MLE)	604281.34	Theta star (bias corrected MLE)	786167.45
nu hat (MLE)	32.230020	nu star (bias corrected)	24.773348
MLE Mean (bias corrected)	885272.73	MLE Sd (bias corrected)	834249.72
		Approximate Chi Square Value (0.05)	14.438257
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	13.167286
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50)	1518962.4	95% Adjusted Gamma UCL (use when n<50)	1665580.2
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9051410	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2045937	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	11.805595	Mean of logged Data	13.315050
Maximum of Logged Data	14.538217	SD of logged Data	0.9477868
Assuming Lognormal Distribution			
95% H-UCL	2264706.6	90% Chebyshev (MVUE) UCL	1715366.9
95% Chebyshev (MVUE) UCL	2084574.8	97.5% Chebyshev (MVUE) UCL	2597020.9
99% Chebyshev (MVUE) UCL	3603622.3		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1256137.2	95% Jackknife UCL	1293927.6
95% Standard Bootstrap UCL	1247076.6	95% Bootstrap-t UCL	1340165.8
95% Hall's Bootstrap UCL	1166572.7	95% Percentile Bootstrap UCL	1237454.5
95% BCA Bootstrap UCL	1283272.7		
90% Chebyshev(Mean, Sd) UCL	1561681.5	95% Chebyshev(Mean, Sd) UCL	1868071.8
97.5% Chebyshev(Mean, Sd) UCL	2293329.8	99% Chebyshev(Mean, Sd) UCL	3128666.7
Suggested UCL to Use			
95% Adjusted Gamma UCL	1665580.2		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
SELENIUM			
General Statistics			

UCL Statistics for Sediment Data Sets with Non-Detects			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	1.0000000
Number of Detects	2.0000000	Number of Non-Detects	8.0000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	1620.0000	Minimum Non-Detect	771.00000
Maximum Detect	1670.0000	Maximum Non-Detect	1340.0000
Variance Detects	1250.0000	Percent Non-Detects	80.000000%
Mean Detects	1645.0000	SD Detects	35.355339
Median Detects	1645.0000	CV Detects	0.0214926
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	7.4053802	SD of Logged Detects	0.0214943

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs			
Mean	945.80000	Standard Error of Mean	156.42580
SD	349.77873	95% KM (BCA) UCL	N/A
95% KM (t) UCL	1232.5462	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	1203.0976	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	1415.0774	95% KM Chebyshev UCL	1627.6443
97.5% KM Chebyshev UCL	1922.6788	99% KM Chebyshev UCL	2502.2171

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	4329.3066	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.3799685	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	17317.227	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	7.3115899	nu hat (KM)	146.23180
		Adjusted Level of Significance (β)	0.0267000
Approximate Chi Square Value (146.23, α)	119.28426	Adjusted Chi Square Value (146.23, β)	115.05725
95% Gamma Approximate KM-UCL (use when n>=50)	1159.4659	95% Gamma Adjusted KM-UCL (use when n<50)	1202.0627

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	1494.3783	Mean in Log Scale	7.3082317

UCL Statistics for Sediment Data Sets with Non-Detects			
SD in Original Scale	80.254632	SD in Log Scale	0.0517006
95% t UCL (assumes normality of ROS data)	1540.9004	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A	95% Bootstrap t UCL	N/A
95% H-UCL (Log ROS)	N/A		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	717.55000	Mean in Log Scale	6.4133860
SD in Original Scale	498.13142	SD in Log Scale	0.5550293
95% t UCL (Assumes normality)	1006.3074	95% H-Stat UCL	1088.7822

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution at 5% Significance Level			

Suggested UCL to Use			
95% KM (t) UCL	1232.5462	95% KM (% Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

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.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

SODIUM

General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	135000.00	Mean	6332272.7
Maximum	14900000	Median	5210000.0
SD	4433578.3	Std. Error of Mean	1336774.2
Coefficient of Variation	0.7001559	Skewness	0.6632889

Normal GOF Test		
Shapiro Wilk Test Statistic	0.9291533	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2037312	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution			
95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	8755124.0	95% Adjusted-CLT UCL (Chen-1995)	8816727.6
		95% Modified-t UCL (Johnson-1978)	8799680.7

UCL Statistics for Sediment Data Sets with Non-Detects			
Gamma GOF Test			
A-D Test Statistic	0.4951745	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7446750	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2348710	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2604168	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.3676454	k star (bias corrected MLE)	1.0552573
Theta hat (MLE)	4630054.4	Theta star (bias corrected MLE)	6000690.9
nu hat (MLE)	30.088199	nu star (bias corrected)	23.215660
MLE Mean (bias corrected)	6332272.7	MLE Sd (bias corrected)	6164252.7
		Approximate Chi Square Value (0.05)	13.253759
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	12.042480
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	11091788	95% Adjusted Gamma UCL (use when n<50)	12207443
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.7591275	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.3119470	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	11.813030	Mean of logged Data	15.252991
Maximum of Logged Data	16.516872	SD of logged Data	1.2707338
Assuming Lognormal Distribution			
95% H-UCL	39196881	90% Chebyshev (MVUE) UCL	18831327
95% Chebyshev (MVUE) UCL	23542331	97.5% Chebyshev (MVUE) UCL	30081021
99% Chebyshev (MVUE) UCL	42925012		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	8531070.6	95% Jackknife UCL	8755124.0
95% Standard Bootstrap UCL	8456915.2	95% Bootstrap-t UCL	9041544.5
95% Hall's Bootstrap UCL	8899285.8	95% Percentile Bootstrap UCL	8592727.3
95% BCA Bootstrap UCL	8691818.2		
90% Chebyshev(Mean, Sd) UCL	10342595	95% Chebyshev(Mean, Sd) UCL	12159136
97.5% Chebyshev(Mean, Sd) UCL	14680425	99% Chebyshev(Mean, Sd) UCL	19633008
Suggested UCL to Use			
95% Student's-t UCL	8755124.0		

UCL Statistics for Sediment Data Sets with Non-Detects

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and 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.

VANADIUM

General Statistics

Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
		Number of Missing Observations	0
Minimum	2480.0000	Mean	9315.4545
Maximum	22700.000	Median	6060.0000
SD	7383.1705	Std. Error of Mean	2226.1097
Coefficient of Variation	0.7925722	Skewness	0.7403116

Normal GOF Test

Shapiro Wilk Test Statistic	0.8562423	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2298742	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	13350.192	95% Adjusted-CLT UCL (Chen-1995)	13508.019
		95% Modified-t UCL (Johnson-1978)	13433.008

Gamma GOF Test

A-D Test Statistic	0.5847068	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7407609	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2340711	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2591851	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.7187030	k star (bias corrected MLE)	1.3105719
Theta hat (MLE)	5420.0491	Theta star (bias corrected MLE)	7107.9311
nu hat (MLE)	37.811466	nu star (bias corrected)	28.832581
MLE Mean (bias corrected)	9315.4545	MLE Sd (bias corrected)	8137.1745
		Approximate Chi Square Value (0.05)	17.577578
Adjusted Level of Significance	0.0278300	Adjusted Chi Square Value	16.159093

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	15280.182	95% Adjusted Gamma UCL (use when n<50)	16621.515

UCL Statistics for Sediment Data Sets with Non-Detects			
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8841274	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2116933	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	7.8160138	Mean of logged Data	8.8211392
Maximum of Logged Data	10.030120	SD of logged Data	0.8562997
Assuming Lognormal Distribution			
95% H-UCL	20480.089	90% Chebyshev (MVUE) UCL	16993.119
95% Chebyshev (MVUE) UCL	20444.212	97.5% Chebyshev (MVUE) UCL	25234.196
99% Chebyshev (MVUE) UCL	34643.193		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	12977.079	95% Jackknife UCL	13350.192
95% Standard Bootstrap UCL	12836.613	95% Bootstrap-t UCL	14131.951
95% Hall's Bootstrap UCL	13181.214	95% Percentile Bootstrap UCL	12837.273
95% BCA Bootstrap UCL	13105.455		
90% Chebyshev(Mean, Sd) UCL	15993.784	95% Chebyshev(Mean, Sd) UCL	19018.842
97.5% Chebyshev(Mean, Sd) UCL	23217.505	99% Chebyshev(Mean, Sd) UCL	31464.966
Suggested UCL to Use			
95% Student's-t UCL	13350.192		
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)			
and 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.			
ZINC			
General Statistics			
Total Number of Observations	9.0000000	Number of Distinct Observations	9.0000000
		Number of Missing Observations	2.0000000
Minimum	3500.0000	Mean	11151.111
Maximum	27100.000	Median	4870.0000
SD	8966.6778	Std. Error of Mean	2988.8926
Coefficient of Variation	0.8041062	Skewness	0.8244910
Note: Sample size is small (e.g., <10), if data are collected using ISM approach, you should use			

UCL Statistics for Sediment Data Sets with Non-Detects			
guidance provided in ITRC Tech Reg Guide on ISM (ITRC, 2012) to compute statistics of interest.			
For example, you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).			
Chebyshev UCL can be computed using the Nonparametric and All UCL Options of ProUCL 5.0			
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8097063	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8290000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3137464	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2953333	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	16709.100	95% Adjusted-CLT UCL (Chen-1995)	16945.121
		95% Modified-t UCL (Johnson-1978)	16846.007
Gamma GOF Test			
A-D Test Statistic	0.8126813	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7314585	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.3193927	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2830318	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.8160687	k star (bias corrected MLE)	1.2847865
Theta hat (MLE)	6140.2475	Theta star (bias corrected MLE)	8679.3494
nu hat (MLE)	32.689236	nu star (bias corrected)	23.126157
MLE Mean (bias corrected)	11151.111	MLE Sd (bias corrected)	9837.9057
		Approximate Chi Square Value (0.05)	13.186081
Adjusted Level of Significance	0.0230800	Adjusted Chi Square Value	11.633447
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	19557.165	95% Adjusted Gamma UCL (use when n<50)	22167.320
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8321855	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8290000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2956642	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2953333	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	8.1605182	Mean of logged Data	9.0193868
Maximum of Logged Data	10.207289	SD of logged Data	0.8211180
Assuming Lognormal Distribution			
95% H-UCL	26518.059	90% Chebyshev (MVUE) UCL	20401.452

UCL Statistics for Sediment Data Sets with Non-Detects			
95% Chebyshev (MVUE) UCL	24635.174	97.5% Chebyshev (MVUE) UCL	30511.415
99% Chebyshev (MVUE) UCL	42054.154		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs			
95% CLT UCL	16067.402	95% Jackknife UCL	16709.100
95% Standard Bootstrap UCL	15859.873	95% Bootstrap-t UCL	18062.581
95% Hall's Bootstrap UCL	15413.823	95% Percentile Bootstrap UCL	16276.667
95% BCA Bootstrap UCL	16357.778		
90% Chebyshev(Mean, Sd) UCL	20117.789	95% Chebyshev(Mean, Sd) UCL	24179.392
97.5% Chebyshev(Mean, Sd) UCL	29816.739	99% Chebyshev(Mean, Sd) UCL	40890.217

Suggested UCL to Use	
95% Chebyshev (Mean, Sd) UCL	24179.392

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and 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.

Appendix C14
ProUCL Output Sediment BTV Calculations,
Outliers Removed

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	Background Statistics for Sediment Data Sets with Non-Detects
User Selected Options	
Date/Time of Computation	5/20/2015 10:51:42 AM
From File	C12 Sediment Data after Removing Outliers.xls
Full Precision	ON
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

ALUMINUM

General Statistics

Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	888000.00	First Quartile	1285000.0
Second Largest	6690000.0	Median	1770000.0
Maximum	7090000.0	Third Quartile	5385000.0
Mean	3326909.1	SD	2504135.0
Coefficient of Variation	0.7526912	Skewness	0.5634560
Mean of logged Data	14.723449	SD of logged Data	0.8267932

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077

Normal GOF Test

Shapiro Wilk Test Statistic	0.8233374	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.2783966	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	10376049	90% Percentile (z)	6536087.3
95% UPL (t)	8067371.7	95% Percentile (z)	7445844.7
95% USL	8920915.7	99% Percentile (z)	9152398.3

Gamma GOF Test

A-D Test Statistic	0.6945147	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7399016	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2435391	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2588717	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.8493010	k star (bias corrected MLE)	1.4055522
Theta hat (MLE)	1799009.0	Theta star (bias corrected MLE)	2366976.5
nu hat (MLE)	40.684621	nu star (bias corrected)	30.922149
MLE Mean (bias corrected)	3326909.1	MLE Sd (bias corrected)	2806192.4

Background Statistics for Sediment Data Sets with Non-Detects			
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	9655879.7	90% Percentile	7043700.1
95% Hawkins Wixley (HW) Approx. Gamma UPL	10045742	95% Percentile	8857946.0
95% WH Approx. Gamma UTL with 95% Coverage	15331142	99% Percentile	12972108
95% HW Approx. Gamma UTL with 95% Coverage	16789925		
95% WH USL	11552444	95% HW USL	12241227
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8696512	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2036522	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	25415553	90% Percentile (z)	7152890.3
95% UPL (t)	11859183	95% Percentile (z)	9659020.1
95% USL	15719754	99% Percentile (z)	16968302
Nonparametric Distribution Free Background Statistics			
Data appear Gamma Distributed at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	7090000.0
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	7090000.0	95% BCA Bootstrap UTL with 95% Coverage	7090000.0
95% UPL	7090000.0	90% Percentile	6690000.0
90% Chebyshev UPL	11173360	95% Percentile	6890000.0
95% Chebyshev UPL	14727538	99% Percentile	7050000.0
95% USL	7090000.0		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
ARSENIC			
General Statistics			
Total Number of Observations	11.000000	Number of Missing Observations	0
Number of Distinct Observations	11.000000		
Number of Detects	6.0000000	Number of Non-Detects	5.0000000
Number of Distinct Detects	6.0000000	Number of Distinct Non-Detects	5.0000000
Minimum Detect	990.00000	Minimum Non-Detect	771.00000
Maximum Detect	5660.0000	Maximum Non-Detect	1340.0000
Variance Detected	3431866.7	Percent Non-Detects	45.454545%

Background Statistics for Sediment Data Sets with Non-Detects			
Mean Detected	3753.3333	SD Detected	1852.5298
Mean of Detected Logged Data	8.0789699	SD of Detected Logged Data	0.6714820
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test on Detects Only			
Shapiro Wilk Test Statistic	0.9085437	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2580188	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.3617080	Detected Data appear Normal at 5% Significance Level	
Detected Data appear Normal at 5% Significance Level			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	2417.6364	SD	1924.6639
95% UTL95% Coverage	7835.5653	95% KM UPL (t)	6061.1289
90% KM Percentile (z)	4884.1924	95% KM Percentile (z)	5583.4268
99% KM Percentile (z)	6895.0741	95% KM USL	6717.1579
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	2283.5909	SD	2138.5564
95% UTL95% Coverage	8303.6272	95% UPL (t)	6331.9935
90% Percentile (z)	5024.2612	95% Percentile (z)	5801.2031
99% Percentile (z)	7258.6170	95% USL	7060.9285
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4416747	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7007095	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2752945	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.3340858	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	3.4596476	k star (bias corrected MLE)	1.8409349
Theta hat (MLE)	1084.8889	Theta star (bias corrected MLE)	2038.8191
nu hat (MLE)	41.515771	nu star (bias corrected)	22.091219
MLE Mean (bias corrected)	3753.3333		
MLE Sd (bias corrected)	2766.2913	95% Percentile of Chisquare (2k)	8.9672094
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	2171.1468
Maximum	5660.0000	Median	990.00000

Background Statistics for Sediment Data Sets with Non-Detects			
SD	2246.1217	CV	1.0345324
k hat (MLE)	0.2844921	k star (bias corrected MLE)	0.2675094
Theta hat (MLE)	7631.6590	Theta star (bias corrected MLE)	8116.1509
nu hat (MLE)	6.2588266	nu star (bias corrected)	5.8852072
MLE Mean (bias corrected)	2171.1468	MLE Sd (bias corrected)	4197.7798
95% Percentile of Chisquare (2k)	2.5372258	90% Percentile	6481.3577
95% Percentile	10296.254	99% Percentile	20358.062

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	22673.869	37580.767	95% Approx. Gamma UPL	11276.828	15488.540
95% Gamma USL	14883.807	22001.189			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)	1.5778734		nu hat (KM)	34.713215	
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	11213.315	12176.878	95% Approx. Gamma UPL	7003.4010	7227.3554
95% Gamma USL	8407.6008	8835.2625			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.8497740	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7880000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2477543	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3617080	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	2361.3154	Mean in Log Scale	7.3723006
SD in Original Scale	2068.7862	SD in Log Scale	0.9479949
95% UTL95% Coverage	22946.167	95% BCA UTL95% Coverage	5660.0000
95% Bootstrap (%) UTL95% Coverage	5660.0000	95% UPL (t)	9574.9539
90% Percentile (z)	5362.6037	95% Percentile (z)	7567.4648
99% Percentile (z)	14438.687	95% USL	13227.240

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	7.4511162	95% KM UTL (Lognormal)95% Coverage	17619.270
KM SD of Logged Data	0.8261571	95% KM UPL (Lognormal)	8226.1728
95% KM Percentile Lognormal (z)	6701.0782	95% KM USL (Lognormal)	10901.710

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	2283.5909	Mean in Log Scale	7.2388897
SD in Original Scale	2138.5564	SD in Log Scale	1.0862655
95% UTL95% Coverage	29635.465	95% UPL (t)	10886.175
90% Percentile (z)	5602.6500	95% Percentile (z)	8313.5124
99% Percentile (z)	17429.530	95% USL	15764.354

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Background Statistics for Sediment Data Sets with Non-Detects			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	11.000000	95% UTL with95% Coverage	5660.0000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% UPL	5660.0000	95% USL	5660.0000
95% KM Chebyshev UPL	11180.095		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
BARIUM			
General Statistics			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	1.0000000
Minimum	2230.0000	First Quartile	3145.0000
Second Largest	10400.000	Median	5195.0000
Maximum	13000.000	Third Quartile	9297.5000
Mean	6339.0000	SD	3750.4798
Coefficient of Variation	0.5916517	Skewness	0.6049274
Mean of logged Data	8.5872449	SD of logged Data	0.6198300
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.9110000	d2max (for USL)	2.1760684
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9043696	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8420000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2211714	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2801778	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	17256.647	90% Percentile (z)	11145.433
95% UPL (t)	13549.617	95% Percentile (z)	12507.990
95% USL	14500.301	99% Percentile (z)	15063.921
Gamma GOF Test			
A-D Test Statistic	0.3738032	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7317707	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1952212	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2683576	Detected data appear Gamma Distributed at 5% Significance Level	

Background Statistics for Sediment Data Sets with Non-Detects			
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.1467004	k star (bias corrected MLE)	2.2693569
Theta hat (MLE)	2014.4911	Theta star (bias corrected MLE)	2793.3024
nu hat (MLE)	62.934007	nu star (bias corrected)	45.387138
MLE Mean (bias corrected)	6339.0000	MLE Sd (bias corrected)	4207.9382
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	15452.114	90% Percentile	11971.237
95% Hawkins Wixley (HW) Approx. Gamma UPL	15874.004	95% Percentile	14454.465
95% WH Approx. Gamma UTL with 95% Coverage	23245.811	99% Percentile	19921.483
95% HW Approx. Gamma UTL with 95% Coverage	24791.518		
95% WH USL	17251.386	95% HW USL	17882.765
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9330789	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.8420000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1618524	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.2801778	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	32583.788	90% Percentile (z)	11867.859
95% UPL (t)	17657.588	95% Percentile (z)	14865.147
95% USL	20661.709	99% Percentile (z)	22678.785
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	10.000000	95% UTL with 95% Coverage	13000.000
Approximate f	0.5263158	Confidence Coefficient (CC) achieved by UTL	0.4012631
95% Percentile Bootstrap UTL with 95% Coverage	13000.000	95% BCA Bootstrap UTL with 95% Coverage	13000.000
95% UPL	13000.000	90% Percentile	10660.000
90% Chebyshev UPL	18139.609	95% Percentile	11830.000
95% Chebyshev UPL	23484.888	99% Percentile	12766.000
95% USL	13000.000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
BERYLLIUM			
General Statistics			

Background Statistics for Sediment Data Sets with Non-Detects			
Total Number of Observations	10.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	10.000000		
Number of Detects	3.0000000	Number of Non-Detects	7.0000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	7.0000000
Minimum Detect	380.00000	Minimum Non-Detect	106.00000
Maximum Detect	416.00000	Maximum Non-Detect	185.00000
Variance Detected	380.33333	Percent Non-Detects	70.000000%
Mean Detected	393.66667	SD Detected	19.502137
Mean of Detected Logged Data	5.9746999	SD of Detected Logged Data	0.0489233

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.9110000	d2max (for USL)	2.1760684

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8518680	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3382884	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	192.30000	SD	132.11363
95% UTL95% Coverage	576.88276	95% KM UPL (t)	446.29968
90% KM Percentile (z)	361.61042	95% KM Percentile (z)	409.60758
99% KM Percentile (z)	499.64225	95% KM USL	479.78829

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	165.05000	SD	158.57376
95% UTL95% Coverage	626.65820	95% UPL (t)	469.92154
90% Percentile (z)	368.27044	95% Percentile (z)	425.88062
99% Percentile (z)	533.94772	95% USL	510.11734

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	621.61007	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.6333016	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3729.6604	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

Background Statistics for Sediment Data Sets with Non-Detects			
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	315.71219	Mean	339.09854
Maximum	416.00000	Median	315.71219
SD	38.761602	CV	0.1143078
k hat (MLE)	91.091446	k star (bias corrected MLE)	63.830679
Theta hat (MLE)	3.7226167	Theta star (bias corrected MLE)	5.3124695
nu hat (MLE)	1821.8289	nu star (bias corrected)	1276.6136
MLE Mean (bias corrected)	339.09854	MLE Sd (bias corrected)	42.443499
95% Percentile of Chisquare (2k)	155.03118	90% Percentile	394.50241
95% Percentile	411.79920	99% Percentile	445.57076
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	458.69201	459.65631	95% Approx. Gamma UPL	414.88602	415.06049
95% Gamma USL	425.84159	426.17324			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	2.1186702	nu hat (KM)	42.373403		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	723.27952	756.49888	95% Approx. Gamma UPL	474.51270	479.73533
95% Gamma USL	531.74261	541.89714			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.8557213	**Shapiro Wilk GOF Test**			
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.3361826	**Lilliefors GOF Test**			
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level			
Detected Data appear Lognormal at 5% Significance Level					
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects					
Mean in Original Scale	343.63263	Mean in Log Scale	5.8350078		
SD in Original Scale	35.729764	SD in Log Scale	0.0991172		
95% UTL95% Coverage	456.47681	95% BCA UTL95% Coverage	416.00000		
95% Bootstrap (%) UTL95% Coverage	416.00000	95% UPL (t)	413.87708		
90% Percentile (z)	388.39839	95% Percentile (z)	402.63928		
99% Percentile (z)	430.77626	95% USL	424.40728		
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution					
KM Mean of Logged Data	5.0568174	95% KM UTL (Lognormal)95% Coverage	904.31924		
KM SD of Logged Data	0.6012934	95% KM UPL (Lognormal)	499.12425		
95% KM Percentile Lognormal (z)	422.35956	95% KM USL (Lognormal)	581.30346		

Background Statistics for Sediment Data Sets with Non-Detects			
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	165.05000	Mean in Log Scale	4.7202771
SD in Original Scale	158.57376	SD in Log Scale	0.8857413
95% UTL95% Coverage	1478.3326	95% UPL (t)	615.96501
90% Percentile (z)	349.11462	95% Percentile (z)	481.63759
99% Percentile (z)	880.79029	95% USL	771.01731
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	10.000000	95% UTL with95% Coverage	416.00000
Approximate f	0.5263158	Confidence Coefficient (CC) achieved by UTL	0.4012631
95% UPL	416.00000	95% USL	416.00000
95% KM Chebyshev UPL	796.27749		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
CALCIUM			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	387000.00	First Quartile	676000.00
Second Largest	1660000.0	Median	1050000.0
Maximum	1960000.0	Third Quartile	1350000.0
Mean	1055727.3	SD	509127.90
Coefficient of Variation	0.4822532	Skewness	0.3189743
Mean of logged Data	13.748955	SD of logged Data	0.5372468
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9603918	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1307493	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	2488922.3	90% Percentile (z)	1708200.9
95% UPL (t)	2019533.8	95% Percentile (z)	1893168.1
95% USL	2193072.0	99% Percentile (z)	2240135.9

Background Statistics for Sediment Data Sets with Non-Detects			
Gamma GOF Test			
A-D Test Statistic	0.2235493	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7322510	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1467703	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2563364	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	4.2991874	k star (bias corrected MLE)	3.1872878
Theta hat (MLE)	245564.38	Theta star (bias corrected MLE)	331230.60
nu hat (MLE)	94.582123	nu star (bias corrected)	70.120332
MLE Mean (bias corrected)	1055727.3	MLE Sd (bias corrected)	591345.23
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	2286811.2	90% Percentile	1848665.3
95% Hawkins Wixley (HW) Approx. Gamma UPL	2345021.7	95% Percentile	2177673.8
95% WH Approx. Gamma UTL with 95% Coverage	3215229.6	99% Percentile	2888561.6
95% HW Approx. Gamma UTL with 95% Coverage	3393822.9		
95% WH USL	2605658.9	95% HW USL	2699250.5
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9481823	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1545033	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	4245220.0	90% Percentile (z)	1862562.9
95% UPL (t)	2586953.9	95% Percentile (z)	2264007.1
95% USL	3106832.4	99% Percentile (z)	3265023.2
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	1960000.0
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	1960000.0	95% BCA Bootstrap UTL with 95% Coverage	1960000.0
95% UPL	1960000.0	90% Percentile	1660000.0
90% Chebyshev UPL	2651027.5	95% Percentile	1810000.0
95% Chebyshev UPL	3373644.8	99% Percentile	1930000.0
95% USL	1960000.0		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			

Background Statistics for Sediment Data Sets with Non-Detects			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
CARBON DISULFIDE			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	10.000000
Minimum	2.7000000	First Quartile	175.00000
Second Largest	1400.0000	Median	650.00000
Maximum	1400.0000	Third Quartile	1025.0000
Mean	632.42727	SD	540.21815
Coefficient of Variation	0.8541981	Skewness	0.2975953
Mean of logged Data	5.6166890	SD of logged Data	1.9255630
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8863403	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2207559	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	2153.1414	90% Percentile (z)	1324.7447
95% UPL (t)	1655.0894	95% Percentile (z)	1521.0071
95% USL	1839.2248	99% Percentile (z)	1889.1626
Gamma GOF Test			
A-D Test Statistic	0.4673224	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7645670	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2080672	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.2653941	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.7224425	k star (bias corrected MLE)	0.5860188
Theta hat (MLE)	875.40149	Theta star (bias corrected MLE)	1079.1928
nu hat (MLE)	15.893736	nu star (bias corrected)	12.892414
MLE Mean (bias corrected)	632.42727	MLE Sd (bias corrected)	826.14221
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	2630.8094	90% Percentile	1653.5410
95% Hawkins Wixley (HW) Approx. Gamma UPL	3112.4222	95% Percentile	2295.1003
95% WH Approx. Gamma UTL with 95% Coverage	4806.3577	99% Percentile	3850.0306
95% HW Approx. Gamma UTL with 95% Coverage	6406.1437		

Background Statistics for Sediment Data Sets with Non-Detects			
95% WH USL	3334.8537	95% HW USL	4127.5269
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8204002	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2179339	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	62140.228	90% Percentile (z)	3243.4644
95% UPL (t)	10528.947	95% Percentile (z)	6528.6686
95% USL	20296.811	99% Percentile (z)	24251.128
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	1400.0000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	1400.0000	95% BCA Bootstrap UTL with 95% Coverage	1400.0000
95% UPL	1400.0000	90% Percentile	1400.0000
90% Chebyshev UPL	2325.1456	95% Percentile	1400.0000
95% Chebyshev UPL	3091.8900	99% Percentile	1400.0000
95% USL	1400.0000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
CHROMIUM			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	1330.0000	First Quartile	2200.0000
Second Largest	13500.000	Median	3680.0000
Maximum	13700.000	Third Quartile	9405.0000
Mean	6029.0909	SD	4767.2203
Coefficient of Variation	0.7907030	Skewness	0.6726091
Mean of logged Data	8.3800202	SD of logged Data	0.8700626
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8448760	Shapiro Wilk GOF Test	

Background Statistics for Sediment Data Sets with Non-Detects			
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2343631	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	19448.816	90% Percentile (z)	12138.529
95% UPL (t)	15053.696	95% Percentile (z)	13870.470
95% USL	16678.621	99% Percentile (z)	17119.304
Gamma GOF Test			
A-D Test Statistic	0.5686983	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7409558	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2287779	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2592562	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.6890951	k star (bias corrected MLE)	1.2890388
Theta hat (MLE)	3569.4207	Theta star (bias corrected MLE)	4677.1988
nu hat (MLE)	37.160091	nu star (bias corrected)	28.358854
MLE Mean (bias corrected)	6029.0909	MLE Sd (bias corrected)	5310.2973
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	18106.179	90% Percentile	13039.090
95% Hawkins Wixley (HW) Approx. Gamma UPL	18886.825	95% Percentile	16532.468
95% WH Approx. Gamma UTL with 95% Coverage	29167.059	99% Percentile	24500.337
95% HW Approx. Gamma UTL with 95% Coverage	32135.922		
95% WH USL	21790.402	95% HW USL	23179.970
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8990618	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2036408	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	50475.648	90% Percentile (z)	13293.763
95% UPL (t)	22631.444	95% Percentile (z)	18235.869
95% USL	30444.470	99% Percentile (z)	32994.243
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	13700.000

Background Statistics for Sediment Data Sets with Non-Detects			
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	13700.000	95% BCA Bootstrap UTL with 95% Coverage	13700.000
95% UPL	13700.000	90% Percentile	13500.000
90% Chebyshev UPL	20966.688	95% Percentile	13600.000
95% Chebyshev UPL	27732.917	99% Percentile	13680.000
95% USL	13700.000		

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

COBALT

General Statistics			
Total Number of Observations	11.000000	Number of Missing Observations	0
Number of Distinct Observations	11.000000		
Number of Detects	8.0000000	Number of Non-Detects	3.0000000
Number of Distinct Detects	8.0000000	Number of Distinct Non-Detects	3.0000000
Minimum Detect	261.00000	Minimum Non-Detect	160.00000
Maximum Detect	2330.0000	Maximum Non-Detect	209.00000
Variance Detected	623523.55	Percent Non-Detects	27.272727%
Mean Detected	1025.8750	SD Detected	789.63508
Mean of Detected Logged Data	6.6372759	SD of Detected Logged Data	0.8471697

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.8726977	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8180000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2624160	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.3132483	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	789.72727	SD	738.57727
95% UTL95% Coverage	2868.8223	95% KM UPL (t)	2187.8939
90% KM Percentile (z)	1736.2521	95% KM Percentile (z)	2004.5788
99% KM Percentile (z)	2507.9149	95% KM USL	2439.6407

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	770.72727	SD	792.12358
95% UTL95% Coverage	3000.5552	95% UPL (t)	2270.2599
90% Percentile (z)	1785.8745	95% Percentile (z)	2073.6546
99% Percentile (z)	2613.4823	95% USL	2540.2583

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Background Statistics for Sediment Data Sets with Non-Detects			
Gamma GOF Tests on Detected Observations Only			
A-D Test Statistic	0.4656078	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.7254104	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2562435	**Kolmogrov-Smirnoff GOF**	
5% K-S Critical Value	0.2979261	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.8381619	k star (bias corrected MLE)	1.2321845
Theta hat (MLE)	558.09829	Theta star (bias corrected MLE)	832.56606
nu hat (MLE)	29.410590	nu star (bias corrected)	19.714952
MLE Mean (bias corrected)	1025.8750		
MLE Sd (bias corrected)	924.18002	95% Percentile of Chisquare (2k)	6.8631933
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	746.09364
Maximum	2330.0000	Median	384.00000
SD	816.13774	CV	1.0938811
k hat (MLE)	0.2356000	k star (bias corrected MLE)	0.2319515
Theta hat (MLE)	3166.7815	Theta star (bias corrected MLE)	3216.5933
nu hat (MLE)	5.1831995	nu star (bias corrected)	5.1029330
MLE Mean (bias corrected)	746.09364	MLE Sd (bias corrected)	1549.1545
95% Percentile of Chisquare (2k)	2.2952326	90% Percentile	2249.4092
95% Percentile	3691.4148	99% Percentile	7571.3580
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	8759.6271	15366.042	95% Approx. Gamma UPL	4200.9685	5975.7606
95% Gamma USL	5631.4498	8700.2229			
The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	1.1433058	nu hat (KM)	25.152727		
	WH	HW	WH	HW	
95% Approx. Gamma UTL with 95% Coverage	4238.3676	4685.0434	95% Approx. Gamma UPL	2527.4560	2625.2842
95% Gamma USL	3092.1454	3284.4782			
Lognormal GOF Test on Detected Observations Only					
Shapiro Wilk Test Statistic	0.8988992	**Shapiro Wilk GOF Test**			
5% Shapiro Wilk Critical Value	0.8180000	Detected Data appear Lognormal at 5% Significance Level			
Lilliefors Test Statistic	0.2231485	**Lilliefors GOF Test**			
5% Lilliefors Critical Value	0.3132483	Detected Data appear Lognormal at 5% Significance Level			

Background Statistics for Sediment Data Sets with Non-Detects			
Detected Data appear Lognormal at 5% Significance Level			
Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	772.56872	Mean in Log Scale	6.0749980
SD in Original Scale	790.36770	SD in Log Scale	1.1957341
95% UTL95% Coverage	12594.172	95% BCA UTL95% Coverage	2330.0000
95% Bootstrap (%) UTL95% Coverage	2330.0000	95% UPL (t)	4182.1764
90% Percentile (z)	2013.0230	95% Percentile (z)	3108.2201
99% Percentile (z)	7021.2140	95% USL	6286.4862
Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	6.2112481	95% KM UTL (Lognormal)95% Coverage	7642.8814
KM SD of Logged Data	0.9699047	95% KM UPL (Lognormal)	3125.4392
95% KM Percentile Lognormal (z)	2456.7618	95% KM USL (Lognormal)	4349.9768
Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	770.72727	Mean in Log Scale	6.0535969
SD in Original Scale	792.12358	SD in Log Scale	1.2269853
95% UTL95% Coverage	13461.117	95% UPL (t)	4343.1114
90% Percentile (z)	2050.9161	95% Percentile (z)	3202.8879
99% Percentile (z)	7390.8026	95% USL	6598.3103
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			
Nonparametric Distribution Free Background Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	11.000000	95% UTL with95% Coverage	2330.0000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% UPL	2330.0000	95% USL	2330.0000
95% KM Chebyshev UPL	4152.2639		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
COPPER			
General Statistics			
Total Number of Observations	10.000000	Number of Distinct Observations	10.000000
		Number of Missing Observations	1.0000000
Minimum	1570.0000	First Quartile	1885.0000
Second Largest	8240.0000	Median	2710.0000
Maximum	12700.000	Third Quartile	6192.5000
Mean	4572.0000	SD	3692.3368
Coefficient of Variation	0.8075977	Skewness	1.3559677

Background Statistics for Sediment Data Sets with Non-Detects			
Mean of logged Data	8.1616427	SD of logged Data	0.7518807
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.9110000	d2max (for USL)	2.1760684
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8164139	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8420000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2549294	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2801778	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	15320.392	90% Percentile (z)	9303.9200
95% UPL (t)	11670.832	95% Percentile (z)	10645.354
95% USL	12606.777	99% Percentile (z)	13161.660
Gamma GOF Test			
A-D Test Statistic	0.5884400	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7354775	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2330329	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2697690	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.0301405	k star (bias corrected MLE)	1.4877650
Theta hat (MLE)	2252.0608	Theta star (bias corrected MLE)	3073.0659
nu hat (MLE)	40.602811	nu star (bias corrected)	29.755301
MLE Mean (bias corrected)	4572.0000	MLE Sd (bias corrected)	3748.3406
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	13006.450	90% Percentile	9546.1652
95% Hawkins Wixley (HW) Approx. Gamma UPL	13346.738	95% Percentile	11942.340
95% WH Approx. Gamma UTL with 95% Coverage	20952.237	99% Percentile	17355.960
95% HW Approx. Gamma UTL with 95% Coverage	22547.341		
95% WH USL	14807.470	95% HW USL	15370.252
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8928944	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8420000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2082863	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2801778	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	31268.527	90% Percentile (z)	9183.9854
95% UPL (t)	14871.431	95% Percentile (z)	12068.769

Background Statistics for Sediment Data Sets with Non-Detects			
95% USL	17993.871	99% Percentile (z)	20146.356

Nonparametric Distribution Free Background Statistics

Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	10.000000	95% UTL with 95% Coverage	12700.000
Approximate f	0.5263158	Confidence Coefficient (CC) achieved by UTL	0.4012631
95% Percentile Bootstrap UTL with 95% Coverage	12700.000	95% BCA Bootstrap UTL with 95% Coverage	12700.000
95% UPL	12700.000	90% Percentile	8686.0000
90% Chebyshev UPL	16189.667	95% Percentile	10693.000
95% Chebyshev UPL	21452.078	99% Percentile	12298.600
95% USL	12700.000		

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

ENDRIN KETONE

General Statistics

Total Number of Observations	10.000000	Number of Missing Observations	0
Number of Distinct Observations	10.000000		
Number of Detects	3.0000000	Number of Non-Detects	7.0000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	7.0000000
Minimum Detect	12.000000	Minimum Non-Detect	0.2610000
Maximum Detect	18.300000	Maximum Non-Detect	0.4470000
Variance Detected	11.610000	Percent Non-Detects	70.000000%
Mean Detected	14.400000	SD Detected	3.4073450
Mean of Detected Logged Data	2.6496783	SD of Detected Logged Data	0.2256772

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.9110000	d2max (for USL)	2.1760684

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.8546348	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3367798	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Background Statistics for Sediment Data Sets with Non-Detects			
Mean	4.5027000	SD	6.6560782
95% UTL95% Coverage	23.878544	95% KM UPL (t)	17.299577
90% KM Percentile (z)	13.032807	95% KM Percentile (z)	15.450974
99% KM Percentile (z)	19.987053	95% KM USL	18.986782
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	4.4444000	SD	7.0553525
95% UTL95% Coverage	24.982531	95% UPL (t)	18.008915
90% Percentile (z)	13.486198	95% Percentile (z)	16.049422
99% Percentile (z)	20.857604	95% USL	19.797330
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			
Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	28.655928	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.5025138	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	171.93557	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	1.6181111	Mean	5.4526778
Maximum	18.300000	Median	1.6181111
SD	6.3797513	CV	1.1700217
k hat (MLE)	1.0204377	k star (bias corrected MLE)	0.7809731
Theta hat (MLE)	5.3434696	Theta star (bias corrected MLE)	6.9819026
nu hat (MLE)	20.408754	nu star (bias corrected)	15.619461
MLE Mean (bias corrected)	5.4526778	MLE Sd (bias corrected)	6.1700944
95% Percentile of Chisquare (2k)	5.1108763	90% Percentile	13.335621
95% Percentile	17.841820	99% Percentile	28.503699
The following statistics are computed using Gamma ROS Statistics on Imputed Data			
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods			
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	36.722874	40.729736	95% Approx. Gamma UPL	20.149422	20.751117
95% Gamma USL	23.781807	24.945019		
The following statistics are computed using gamma distribution and KM estimates				
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods				
k hat (KM)	0.4576244	nu hat (KM)	9.1524884	
	WH	HW	WH	HW
95% Approx. Gamma UTL with 95% Coverage	45.374750	55.197170	95% Approx. Gamma UPL	20.897162	22.086657

Background Statistics for Sediment Data Sets with Non-Detects					
95% Gamma USL	26.006368	28.519700			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.8741170	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.3256391	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	8.2375903	Mean in Log Scale	2.0004097
SD in Original Scale	4.5457093	SD in Log Scale	0.4604952
95% UTL95% Coverage	28.244851	95% BCA UTL95% Coverage	18.300000
95% Bootstrap (%) UTL95% Coverage	18.300000	95% UPL (t)	17.917016
90% Percentile (z)	13.337212	95% Percentile (z)	15.766018
99% Percentile (z)	21.578160	95% USL	20.135385

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	-0.145361	95% KM UTL (Lognormal)95% Coverage	179.33093
KM SD of Logged Data	1.8325640	95% KM UPL (Lognormal)	29.309136
95% KM Percentile Lognormal (z)	17.618309	95% KM USL (Lognormal)	46.638375

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	4.4444000	Mean in Log Scale	-0.427371
SD in Original Scale	7.0553525	SD in Log Scale	2.1329580
95% UTL95% Coverage	324.30007	95% UPL (t)	39.386445
90% Percentile (z)	10.035453	95% Percentile (z)	21.780873
99% Percentile (z)	93.189105	95% USL	67.632661
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	10.000000	95% UTL with95% Coverage	18.300000
Approximate f	0.5263158	Confidence Coefficient (CC) achieved by UTL	0.4012631
95% UPL	18.300000	95% USL	18.300000
95% KM Chebyshev UPL	34.931972		

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

IRON

General Statistics

Background Statistics for Sediment Data Sets with Non-Detects			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	486000.00	First Quartile	1274500.0
Second Largest	9260000.0	Median	2520000.0
Maximum	10200000	Third Quartile	7195000.0
Mean	4087818.2	SD	3656919.3
Coefficient of Variation	0.8945895	Skewness	0.6919233
Mean of logged Data	14.742877	SD of logged Data	1.1190236
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8521379	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2459828	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	14382046	90% Percentile (z)	8774348.8
95% UPL (t)	11010564	95% Percentile (z)	10102915
95% USL	12257038	99% Percentile (z)	12595085
Gamma GOF Test			
A-D Test Statistic	0.3860060	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7482024	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1759691	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2614241	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.1790167	k star (bias corrected MLE)	0.9180728
Theta hat (MLE)	3467141.8	Theta star (bias corrected MLE)	4452608.0
nu hat (MLE)	25.938368	nu star (bias corrected)	20.197601
MLE Mean (bias corrected)	4087818.2	MLE Sd (bias corrected)	4266315.9
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	14139972	90% Percentile	9612422.2
95% Hawkins Wixley (HW) Approx. Gamma UPL	15124004	95% Percentile	12623164
95% WH Approx. Gamma UTL with 95% Coverage	24155583	99% Percentile	19658311
95% HW Approx. Gamma UTL with 95% Coverage	27824197		
95% WH USL	17431651	95% HW USL	19156219
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9171001	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1725030	**Lilliefors Lognormal GOF Test**	

Background Statistics for Sediment Data Sets with Non-Detects			
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	58992941	90% Percentile (z)	10606350
95% UPL (t)	21025551	95% Percentile (z)	15926692
95% USL	30789134	99% Percentile (z)	34144604
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	10200000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	10200000	95% BCA Bootstrap UTL with 95% Coverage	10200000
95% UPL	10200000	90% Percentile	9260000.0
90% Chebyshev UPL	15546401	95% Percentile	9730000.0
95% Chebyshev UPL	20736753	99% Percentile	10106000
95% USL	10200000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
LEAD			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	1490.0000	First Quartile	4060.0000
Second Largest	9470.0000	Median	5720.0000
Maximum	12700.000	Third Quartile	7755.0000
Mean	6022.7273	SD	3262.7690
Coefficient of Variation	0.5417428	Skewness	0.7781310
Mean of logged Data	8.5557295	SD of logged Data	0.6003457
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9488995	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1679141	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			

Background Statistics for Sediment Data Sets with Non-Detects			
95% UTL with 95% Coverage	15207.422	90% Percentile (z)	10204.134
95% UPL (t)	12199.325	95% Percentile (z)	11389.505
95% USL	13311.452	99% Percentile (z)	13613.063
Gamma GOF Test			
A-D Test Statistic	0.1633822	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7330228	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1098045	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.2567114	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	3.5463347	k star (bias corrected MLE)	2.6397586
Theta hat (MLE)	1698.2964	Theta star (bias corrected MLE)	2281.5447
nu hat (MLE)	78.019363	nu star (bias corrected)	58.074688
MLE Mean (bias corrected)	6022.7273	MLE Sd (bias corrected)	3706.9019
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	13850.266	90% Percentile	10990.459
95% Hawkins Wixley (HW) Approx. Gamma UPL	14268.687	95% Percentile	13120.061
95% WH Approx. Gamma UTL with 95% Coverage	19959.293	99% Percentile	17768.589
95% HW Approx. Gamma UTL with 95% Coverage	21264.614		
95% WH USL	15936.798	95% HW USL	16614.054
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9674709	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1405607	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	28161.268	90% Percentile (z)	11216.078
95% UPL (t)	16191.091	95% Percentile (z)	13949.660
95% USL	19867.620	99% Percentile (z)	21001.363
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	12700.000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	12700.000	95% BCA Bootstrap UTL with 95% Coverage	12700.000
95% UPL	12700.000	90% Percentile	9470.0000
90% Chebyshev UPL	16246.281	95% Percentile	11085.000
95% Chebyshev UPL	20877.206	99% Percentile	12377.000
95% USL	12700.000		

Background Statistics for Sediment Data Sets with Non-Detects			
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations. The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.			
MAGNESIUM			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	348000.00	First Quartile	830000.00
Second Largest	3110000.0	Median	1530000.0
Maximum	3400000.0	Third Quartile	2610000.0
Mean	1709636.4	SD	1073747.4
Coefficient of Variation	0.6280560	Skewness	0.4283252
Mean of logged Data	14.135630	SD of logged Data	0.7326336
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9164759	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1726022	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	4732235.3	90% Percentile (z)	3085699.0
95% UPL (t)	3742298.1	95% Percentile (z)	3475793.7
95% USL	4108288.9	99% Percentile (z)	4207546.3
Gamma GOF Test			
A-D Test Statistic	0.2664805	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7363931	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.1441796	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.2578002	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.4669665	k star (bias corrected MLE)	1.8547635
Theta hat (MLE)	693011.58	Theta star (bias corrected MLE)	921754.36
nu hat (MLE)	54.273263	nu star (bias corrected)	40.804797
MLE Mean (bias corrected)	1709636.4	MLE Sd (bias corrected)	1255334.5
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	4461271.2	90% Percentile	3384827.3

Background Statistics for Sediment Data Sets with Non-Detects			
95% Hawkins Wixley (HW) Approx. Gamma UPL	4643261.5	95% Percentile	4153815.9
95% WH Approx. Gamma UTL with 95% Coverage	6769451.1	99% Percentile	5867218.0
95% HW Approx. Gamma UTL with 95% Coverage	7364205.9		
95% WH USL	5240559.5	95% HW USL	5541074.4
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9458643	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.1213088	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	10831765	90% Percentile (z)	3521993.9
95% UPL (t)	5512589.2	95% Percentile (z)	4596037.7
95% USL	7076329.6	99% Percentile (z)	7572173.3
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	3400000.0
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	3400000.0	95% BCA Bootstrap UTL with 95% Coverage	3400000.0
95% UPL	3400000.0	90% Percentile	3110000.0
90% Chebyshev UPL	5074114.1	95% Percentile	3255000.0
95% Chebyshev UPL	6598109.1	99% Percentile	3371000.0
95% USL	3400000.0		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
MANGANESE			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	3600.0000	First Quartile	6315.0000
Second Largest	51800.000	Median	8460.0000
Maximum	67900.000	Third Quartile	31250.000
Mean	21219.091	SD	21884.395
Coefficient of Variation	1.0313540	Skewness	1.2986720
Mean of logged Data	9.4787953	SD of logged Data	1.0309411
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077

Background Statistics for Sediment Data Sets with Non-Detects			
Normal GOF Test			
Shapiro Wilk Test Statistic	0.7984014	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2655154	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	82823.662	90% Percentile (z)	49265.071
95% UPL (t)	62647.430	95% Percentile (z)	57215.717
95% USL	70106.809	99% Percentile (z)	72129.806
Gamma GOF Test			
A-D Test Statistic	0.6055168	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7483349	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2493813	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2614619	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.1719308	k star (bias corrected MLE)	0.9129194
Theta hat (MLE)	18106.095	Theta star (bias corrected MLE)	23243.116
nu hat (MLE)	25.782478	nu star (bias corrected)	20.084226
MLE Mean (bias corrected)	21219.091	MLE Sd (bias corrected)	22208.057
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	72912.507	90% Percentile	49965.131
95% Hawkins Wixley (HW) Approx. Gamma UPL	75984.812	95% Percentile	65655.987
95% WH Approx. Gamma UTL with 95% Coverage	124977.11	99% Percentile	102336.05
95% HW Approx. Gamma UTL with 95% Coverage	139236.23		
95% WH USL	90010.621	95% HW USL	96087.674
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9119437	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2091663	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	238206.77	90% Percentile (z)	49020.772
95% UPL (t)	92080.853	95% Percentile (z)	71292.216
95% USL	130852.04	99% Percentile (z)	143935.83
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Normal at 5% Significance Level			

Background Statistics for Sediment Data Sets with Non-Detects			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	67900.000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	67900.000	95% BCA Bootstrap UTL with 95% Coverage	67900.000
95% UPL	67900.000	90% Percentile	51800.000
90% Chebyshev UPL	89791.605	95% Percentile	59850.000
95% Chebyshev UPL	120852.64	99% Percentile	66290.000
95% USL	67900.000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
MERCURY			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	9.0000000
Minimum	27.000000	First Quartile	63.000000
Second Largest	220.00000	Median	170.00000
Maximum	290.00000	Third Quartile	190.00000
Mean	139.63636	SD	85.097912
Coefficient of Variation	0.6094251	Skewness	0.1239760
Mean of logged Data	4.6967544	SD of logged Data	0.8090184
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.9373426	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.1848369	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	379.18698	90% Percentile (z)	248.69373
95% UPL (t)	300.73130	95% Percentile (z)	279.60997
95% USL	329.73724	99% Percentile (z)	337.60371
Gamma GOF Test			
A-D Test Statistic	0.4982573	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7377459	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2456728	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2581817	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			

Background Statistics for Sediment Data Sets with Non-Detects			
Gamma Statistics			
k hat (MLE)	2.2159741	k star (bias corrected MLE)	1.6722236
Theta hat (MLE)	63.013537	Theta star (bias corrected MLE)	83.503407
nu hat (MLE)	48.751429	nu star (bias corrected)	36.788918
MLE Mean (bias corrected)	139.63636	MLE Sd (bias corrected)	107.98200
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	379.74271	90% Percentile	283.40498
95% Hawkins Wixley (HW) Approx. Gamma UPL	400.79800	95% Percentile	350.87559
95% WH Approx. Gamma UTL with 95% Coverage	585.11583	99% Percentile	502.17645
95% HW Approx. Gamma UTL with 95% Coverage	650.08003		
95% WH USL	448.84170	95% HW USL	482.57932
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8876902	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2517820	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	1068.6389	90% Percentile (z)	309.06547
95% UPL (t)	506.87771	95% Percentile (z)	414.66509
95% USL	667.82539	99% Percentile (z)	719.68422
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	290.00000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	290.00000	95% BCA Bootstrap UTL with 95% Coverage	290.00000
95% UPL	290.00000	90% Percentile	220.00000
90% Chebyshev UPL	406.28197	95% Percentile	255.00000
95% Chebyshev UPL	527.06345	99% Percentile	283.00000
95% USL	290.00000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
METHOXYCHLOR			
General Statistics			
Total Number of Observations	11.000000	Number of Missing Observations	0

Background Statistics for Sediment Data Sets with Non-Detects			
Number of Distinct Observations	11.000000		
Number of Detects	2.0000000	Number of Non-Detects	9.0000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	9.0000000
Minimum Detect	22.400000	Minimum Non-Detect	1.5700000
Maximum Detect	362.00000	Maximum Non-Detect	2.6900000
Variance Detected	57664.080	Percent Non-Detects	81.818182%
Mean Detected	192.20000	SD Detected	240.13346
Mean of Detected Logged Data	4.5003526	SD of Detected Logged Data	1.9675835

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	36.230000	SD	103.18968
95% UTL95% Coverage	326.70894	95% KM UPL (t)	231.57362
90% KM Percentile (z)	168.47289	95% KM Percentile (z)	205.96191
99% KM Percentile (z)	276.28508	95% KM USL	266.74621

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	35.799545	SD	108.37814
95% UTL95% Coverage	340.88401	95% UPL (t)	240.96521
90% Percentile (z)	174.69172	95% Percentile (z)	214.06572
99% Percentile (z)	287.92480	95% USL	277.90631

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only			
k hat (MLE)	0.7847737	k star (bias corrected MLE)	N/A
Theta hat (MLE)	244.91136	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	3.1390948	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	k hat (KM)	0.1232719		nu hat (KM)	2.7119823
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	305.35058	307.44981	95% Approx. Gamma UPL	135.48240	120.11840

Background Statistics for Sediment Data Sets with Non-Detects					
95% Gamma USL	187.81540	174.53914			

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	34.946120	Mean in Log Scale	-5.002013
SD in Original Scale	108.67944	SD in Log Scale	4.7391177
95% UTL95% Coverage	4182.2457	95% BCA UTL95% Coverage	N/A
95% Bootstrap (%) UTL95% Coverage	N/A	95% UPL (t)	52.952358
90% Percentile (z)	2.9194958	95% Percentile (z)	16.332258
99% Percentile (z)	412.74240	95% USL	266.33073

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	35.799545	Mean in Log Scale	0.8396238
SD in Original Scale	108.37814	SD in Log Scale	1.9218382
95% UTL95% Coverage	517.80484	95% UPL (t)	88.037884
90% Percentile (z)	27.182099	95% Percentile (z)	54.640010
99% Percentile (z)	202.44902	95% USL	169.49663

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11.000000	95% UTL with95% Coverage	362.00000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% UPL	362.00000	95% USL	362.00000
95% KM Chebyshev UPL	506.02385		

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

METHYL_ACETATE

General Statistics

Total Number of Observations	11.000000	Number of Missing Observations	0
Number of Distinct Observations	9.0000000		
Number of Detects	1.0000000	Number of Non-Detects	10.000000
Number of Distinct Detects	1.0000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	3.3000000	Minimum Non-Detect	0.6200000
Maximum Detect	3.3000000	Maximum Non-Detect	2.1000000
Variance Detected	N/A	Percent Non-Detects	90.909091%
Mean Detected	3.3000000	SD Detected	N/A
Mean of Detected Logged Data	1.1939225	SD of Detected Logged Data	N/A

	Background Statistics for Sediment Data Sets with Non-Detects		
Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!			
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).			
The data set for variable METHYL_ACETATE was not processed!			
NICKEL			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	477.00000	First Quartile	703.00000
Second Largest	3490.0000	Median	1160.0000
Maximum	3970.0000	Third Quartile	2270.0000
Mean	1596.6364	SD	1232.6404
Coefficient of Variation	0.7720232	Skewness	1.0460842
Mean of logged Data	7.1124979	SD of logged Data	0.7562470
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8358625	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2470907	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Approximate Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	5066.5190	90% Percentile (z)	3176.3285
95% UPL (t)	3930.0910	95% Percentile (z)	3624.1493
95% USL	4350.2412	99% Percentile (z)	4464.1866
Gamma GOF Test			
A-D Test Statistic	0.5204542	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7386347	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2191133	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.2584324	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	2.0510719	k star (bias corrected MLE)	1.5522947
Theta hat (MLE)	778.43998	Theta star (bias corrected MLE)	1028.5652
nu hat (MLE)	45.123582	nu star (bias corrected)	34.150484
MLE Mean (bias corrected)	1596.6364	MLE Sd (bias corrected)	1281.5009
Background Statistics Assuming Gamma Distribution			

Background Statistics for Sediment Data Sets with Non-Detects			
95% Wilson Hilferty (WH) Approx. Gamma UPL	4440.8362	90% Percentile	3299.4274
95% Hawkins Wixley (HW) Approx. Gamma UPL	4567.1210	95% Percentile	4111.8296
95% WH Approx. Gamma UTL with 95% Coverage	6937.4967	99% Percentile	5942.2469
95% HW Approx. Gamma UTL with 95% Coverage	7460.9061		
95% WH USL	5278.2415	95% HW USL	5514.7290

Lognormal GOF Test		
Shapiro Wilk Test Statistic	0.9154410	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1993451	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level
Data appear Lognormal at 5% Significance Level		

Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	10314.782	90% Percentile (z)	3234.6223
95% UPL (t)	5136.4337	95% Percentile (z)	4257.3985
95% USL	6646.7544	99% Percentile (z)	7128.0398

Nonparametric Distribution Free Background Statistics
Data appear Approximate Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	3970.0000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	3970.0000	95% BCA Bootstrap UTL with 95% Coverage	3970.0000
95% UPL	3970.0000	90% Percentile	3490.0000
90% Chebyshev UPL	5458.9890	95% Percentile	3730.0000
95% Chebyshev UPL	7208.5046	99% Percentile	3922.0000
95% USL	3970.0000		

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

POTASSIUM

General Statistics

Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	134000.00	First Quartile	343000.00
Second Largest	1850000.0	Median	411000.00
Maximum	2060000.0	Third Quartile	1650000.0
Mean	885272.73	SD	747797.98
Coefficient of Variation	0.8447092	Skewness	0.6431156
Mean of logged Data	13.315050	SD of logged Data	0.9477868

Critical Values for Background Threshold Values (BTVs)

Background Statistics for Sediment Data Sets with Non-Detects			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8092631	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2824878	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	2990324.0	90% Percentile (z)	1843614.4
95% UPL (t)	2300894.6	95% Percentile (z)	2115290.9
95% USL	2555784.4	99% Percentile (z)	2624911.0
Gamma GOF Test			
A-D Test Statistic	0.6798598	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7428545	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2481272	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2598969	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.4650009	k star (bias corrected MLE)	1.1260613
Theta hat (MLE)	604281.34	Theta star (bias corrected MLE)	786167.45
nu hat (MLE)	32.230020	nu star (bias corrected)	24.773348
MLE Mean (bias corrected)	885272.73	MLE Sd (bias corrected)	834249.72
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	2806991.5	90% Percentile	1979534.6
95% Hawkins Wixley (HW) Approx. Gamma UPL	2943398.4	95% Percentile	2543709.0
95% WH Approx. Gamma UTL with 95% Coverage	4627702.9	99% Percentile	3842570.0
95% HW Approx. Gamma UTL with 95% Coverage	5156405.4		
95% WH USL	3410258.0	95% HW USL	3655067.4
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.9051410	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2045937	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	8736934.7	90% Percentile (z)	2042505.4
95% UPL (t)	3646438.9	95% Percentile (z)	2882073.7
95% USL	5036985.5	99% Percentile (z)	5498203.2
Nonparametric Distribution Free Background Statistics			

Background Statistics for Sediment Data Sets with Non-Detects			
Data appear Gamma Distributed at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	2060000.0
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	2060000.0	95% BCA Bootstrap UTL with 95% Coverage	2060000.0
95% UPL	2060000.0	90% Percentile	1850000.0
90% Chebyshev UPL	3228421.3	95% Percentile	1955000.0
95% Chebyshev UPL	4289788.6	99% Percentile	2039000.0
95% USL	2060000.0		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
SELENIUM			
General Statistics			
Total Number of Observations	10.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	10.000000		
Number of Detects	2.0000000	Number of Non-Detects	8.0000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	8.0000000
Minimum Detect	1620.0000	Minimum Non-Detect	771.00000
Maximum Detect	1670.0000	Maximum Non-Detect	1340.0000
Variance Detected	1250.0000	Percent Non-Detects	80.000000%
Mean Detected	1645.0000	SD Detected	35.355339
Mean of Detected Logged Data	7.4053802	SD of Detected Logged Data	0.0214943
Warning: Data set has only 2 Detected Values.			
This is not enough to compute meaningful or reliable statistics and estimates.			
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.9110000	d2max (for USL)	2.1760684
Normal GOF Test on Detects Only			
Not Enough Data to Perform GOF Test			
Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	945.80000	SD	349.77873
95% UTL95% Coverage	1964.0059	95% KM UPL (t)	1618.2794
90% KM Percentile (z)	1394.0595	95% KM Percentile (z)	1521.1348
99% KM Percentile (z)	1759.5070	95% KM USL	1706.9424
DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	717.55000	SD	498.13142

Background Statistics for Sediment Data Sets with Non-Detects			
95% UTL95% Coverage	2167.6106	95% UPL (t)	1675.2500
90% Percentile (z)	1355.9311	95% Percentile (z)	1536.9033
99% Percentile (z)	1876.3770	95% USL	1801.5181
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			

Gamma Statistics on Detected Data Only			
k hat (MLE)	4329.3066	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.3799685	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	17317.227	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)		7.3115899	nu hat (KM)		146.23180
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	2080.2448	2099.7703	95% Approx. Gamma UPL	1611.2708	1610.2396
95% Gamma USL	1723.9880	1726.6015			

Lognormal GOF Test on Detected Observations Only			
Not Enough Data to Perform GOF Test			

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	1494.3783	Mean in Log Scale	7.3082317
SD in Original Scale	80.254632	SD in Log Scale	0.0517006
95% UTL95% Coverage	1734.9470	95% BCA UTL95% Coverage	N/A
95% Bootstrap (%) UTL95% Coverage	N/A	95% UPL (t)	1648.5155
90% Percentile (z)	1594.7762	95% Percentile (z)	1625.0138
99% Percentile (z)	1683.2896	95% USL	1670.2619

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	717.55000	Mean in Log Scale	6.4133860
SD in Original Scale	498.13142	SD in Log Scale	0.5550293
95% UTL95% Coverage	3068.9057	95% UPL (t)	1773.0865
90% Percentile (z)	1242.2564	95% Percentile (z)	1519.7908
99% Percentile (z)	2218.4793	95% USL	2040.9440
DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.			

Nonparametric Distribution Free Background Statistics			
Data do not follow a Discernible Distribution (0.05)			

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	10.000000	95% UTL with95% Coverage	1670.0000
Approximate f	0.5263158	Confidence Coefficient (CC) achieved by UTL	0.4012631

Background Statistics for Sediment Data Sets with Non-Detects			
95% UPL	1670.0000	95% USL	1670.0000
95% KM Chebyshev UPL	2544.8666		

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

SODIUM

General Statistics

Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	135000.00	First Quartile	3255000.0
Second Largest	11200000	Median	5210000.0
Maximum	14900000	Third Quartile	9665000.0
Mean	6332272.7	SD	4433578.3
Coefficient of Variation	0.7001559	Skewness	0.6632889
Mean of logged Data	15.252991	SD of logged Data	1.2707338

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077

Normal GOF Test

Shapiro Wilk Test Statistic	0.9291533	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.2037312	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	18812796	90% Percentile (z)	12014132
95% UPL (t)	14725276	95% Percentile (z)	13624860
95% USL	16236478	99% Percentile (z)	16646318

Gamma GOF Test

A-D Test Statistic	0.4951745	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.7446750	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.2348710	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.2604168	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.3676454	k star (bias corrected MLE)	1.0552573
Theta hat (MLE)	4630054.4	Theta star (bias corrected MLE)	6000690.9
nu hat (MLE)	30.088199	nu star (bias corrected)	23.215660
MLE Mean (bias corrected)	6332272.7	MLE Sd (bias corrected)	6164252.7

Background Statistics for Sediment Data Sets with Non-Detects			
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	20325146	90% Percentile	14388414
95% Hawkins Wixley (HW) Approx. Gamma UPL	22809589	95% Percentile	18613508
95% WH Approx. Gamma UTL with 95% Coverage	33368760	99% Percentile	28385707
95% HW Approx. Gamma UTL with 95% Coverage	40640097		
95% WH USL	24651083	95% HW USL	28518371
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.7591275	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.3119470	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data Not Lognormal at 5% Significance Level	
Data Not Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	1.5060E+8	90% Percentile (z)	21455731
95% UPL (t)	46667525	95% Percentile (z)	34043939
95% USL	71965221	99% Percentile (z)	80935279
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	14900000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	14900000	95% BCA Bootstrap UTL with 95% Coverage	14900000
95% UPL	14900000	90% Percentile	11200000
90% Chebyshev UPL	20224437	95% Percentile	13050000
95% Chebyshev UPL	26517120	99% Percentile	14530000
95% USL	14900000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
VANADIUM			
General Statistics			
Total Number of Observations	11.000000	Number of Distinct Observations	11.000000
Minimum	2480.0000	First Quartile	3210.0000
Second Largest	19400.000	Median	6060.0000
Maximum	22700.000	Third Quartile	14450.000
Mean	9315.4545	SD	7383.1705
Coefficient of Variation	0.7925722	Skewness	0.7403116
Mean of logged Data	8.8211392	SD of logged Data	0.8562997

Background Statistics for Sediment Data Sets with Non-Detects			
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.8150000	d2max (for USL)	2.2339077
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8562423	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.2298742	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Normal at 5% Significance Level	
Data appear Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	30099.080	90% Percentile (z)	18777.368
95% UPL (t)	23292.195	95% Percentile (z)	21459.689
95% USL	25808.776	99% Percentile (z)	26491.278
Gamma GOF Test			
A-D Test Statistic	0.5847068	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.7407609	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.2340711	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2591851	Detected data appear Gamma Distributed at 5% Significance Level	
Detected data appear Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.7187030	k star (bias corrected MLE)	1.3105719
Theta hat (MLE)	5420.0491	Theta star (bias corrected MLE)	7107.9311
nu hat (MLE)	37.811466	nu star (bias corrected)	28.832581
MLE Mean (bias corrected)	9315.4545	MLE Sd (bias corrected)	8137.1745
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	27779.385	90% Percentile	20064.480
95% Hawkins Wixley (HW) Approx. Gamma UPL	28915.916	95% Percentile	25399.636
95% WH Approx. Gamma UTL with 95% Coverage	44629.281	99% Percentile	37554.724
95% HW Approx. Gamma UTL with 95% Coverage	49010.476		
95% WH USL	33395.277	95% HW USL	35433.752
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8841274	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8500000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2116933	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2671391	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	75479.983	90% Percentile (z)	20303.151
95% UPL (t)	34274.627	95% Percentile (z)	27712.166
95% USL	45891.428	99% Percentile (z)	49671.674

Background Statistics for Sediment Data Sets with Non-Detects			
Nonparametric Distribution Free Background Statistics			
Data appear Normal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	11.000000	95% UTL with 95% Coverage	22700.000
Approximate f	0.5789474	Confidence Coefficient (CC) achieved by UTL	0.4311999
95% Percentile Bootstrap UTL with 95% Coverage	22700.000	95% BCA Bootstrap UTL with 95% Coverage	22700.000
95% UPL	22700.000	90% Percentile	19400.000
90% Chebyshev UPL	32449.865	95% Percentile	21050.000
95% Chebyshev UPL	42928.974	99% Percentile	22370.000
95% USL	22700.000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			
ZINC			
General Statistics			
Total Number of Observations	9.0000000	Number of Distinct Observations	9.0000000
		Number of Missing Observations	2.0000000
Minimum	3500.0000	First Quartile	4150.0000
Second Largest	19900.000	Median	4870.0000
Maximum	27100.000	Third Quartile	19700.000
Mean	11151.111	SD	8966.6778
Coefficient of Variation	0.8041062	Skewness	0.8244910
Mean of logged Data	9.0193868	SD of logged Data	0.8211180
Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	3.0310000	d2max (for USL)	2.1095618
Normal GOF Test			
Shapiro Wilk Test Statistic	0.8097063	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.8290000	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.3137464	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.2953333	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Background Statistics Assuming Normal Distribution			
95% UTL with 95% Coverage	38329.112	90% Percentile (z)	22642.371
95% UPL (t)	28727.017	95% Percentile (z)	25899.984
95% USL	30066.872	99% Percentile (z)	32010.723
Gamma GOF Test			
A-D Test Statistic	0.8126813	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.7314585	Data Not Gamma Distributed at 5% Significance Level	

Background Statistics for Sediment Data Sets with Non-Detects			
K-S Test Statistic	0.3193927	**Kolmogrov-Smirnoff Gamma GOF Test**	
5% K-S Critical Value	0.2830318	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	1.8160687	k star (bias corrected MLE)	1.2847865
Theta hat (MLE)	6140.2475	Theta star (bias corrected MLE)	8679.3494
nu hat (MLE)	32.689236	nu star (bias corrected)	23.126157
MLE Mean (bias corrected)	11151.111	MLE Sd (bias corrected)	9837.9057
Background Statistics Assuming Gamma Distribution			
95% Wilson Hilferty (WH) Approx. Gamma UPL	34134.146	90% Percentile	24136.100
95% Hawkins Wixley (HW) Approx. Gamma UPL	35432.106	95% Percentile	30612.292
95% WH Approx. Gamma UTL with 95% Coverage	58116.979	99% Percentile	45386.814
95% HW Approx. Gamma UTL with 95% Coverage	64019.191		
95% WH USL	36983.328	95% HW USL	38690.936
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.8321855	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.8290000	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2956642	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.2953333	Data Not Lognormal at 5% Significance Level	
Data appear Approximate Lognormal at 5% Significance Level			
Background Statistics assuming Lognormal Distribution			
95% UTL with 95% Coverage	99528.127	90% Percentile (z)	23663.568
95% UPL (t)	41311.228	95% Percentile (z)	31888.662
95% USL	46704.044	99% Percentile (z)	55803.563
Nonparametric Distribution Free Background Statistics			
Data appear Approximate Lognormal at 5% Significance Level			
Nonparametric Upper Limits for Background Threshold Values			
Order of Statistic, r	9.0000000	95% UTL with 95% Coverage	27100.000
Approximate f	0.4736842	Confidence Coefficient (CC) achieved by UTL	0.3697506
95% Percentile Bootstrap UTL with 95% Coverage	27100.000	95% BCA Bootstrap UTL with 95% Coverage	27100.000
95% UPL	27100.000	90% Percentile	21340.000
90% Chebyshev UPL	39506.236	95% Percentile	24220.000
95% Chebyshev UPL	52350.153	99% Percentile	26524.000
95% USL	27100.000		
Note: The use of USL to estimate a BTV is recommended only when the data set represents a background			
data set free of outliers and consists of observations collected from clean unimpacted locations.			
The use of USL tends to provide a balance between false positives and false negatives provided the data			
represents a background data set and when many onsite observations need to be compared with the BTV.			

Appendix C15
Sediment Outliers Compared to USL Concentrations

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Table C15
Sediment Outliers Compared to USLs
MCRD Parris Island, South Carolina

Parameter	Lowest Outlier	Is Lowest Outlier > USL?	USL	UTL	BTV selected
Aluminum	NA	NA	11,600,000	NA	11,600,000
Arsenic	NA	NA	6,720	NA	6,720
Barium	[a] 18,600	YES	14,500	NA	14,500
Beryllium	[a,b] 165	b	416	416	416
Calcium	NA	NA	2,190,000	NA	2,190,000
Carbon Disulfide	NA	NA	1,840	NA	1,840
Chromium	NA	NA	16,700	NA	16,700
Cobalt	NA	NA	2,440	NA	2,440
Copper	[a] 23,000	YES	12,600	NA	12,600
Endrin Ketone	[a] 76.5	YES	18	NA	18
Iron	NA	NA	12,300,000	NA	12,300,000
Lead	NA	NA	13,300	NA	13,300
Magnesium	NA	NA	4,110,000	NA	4,110,000
Manganese	NA	NA	70,100	NA	70,100
Mercury	NA	NA	330	NA	330
Methyl Acetate	See Table 6				
Methoxychlor	See Table 6				
Nickel	NA		4,350	NA	4,350
Potassium	NA		3,410,000	NA	3,410,000
Selenium	See Table 6				
Sodium	NA		16,200,000	NA	16,200,000
Vanadium	NA		25,800	NA	25,800
Zinc	[a] 52,100	YES	46,700	NA	46,700

Notes:
All units are micrograms per kilogram
BTV = Background threshold value
USL = ProUCL upper simultaneous levelimit
UTL = ProUCL upper tolerance limit
NA = Not applicable
a = Identified as containing outlier data by ProUCL; see Appendix B
b = The data for beryllium included a lower bound outlier. The lower bound outlier was removed before attempting to use ProUCL, per the methods description in the memo. This did not affect the upper bound value, which was selected as the estimated BTV.

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Appendix C16
Sediment Compounds with Three or Fewer Detected Concentrations

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Table C16
Sediment Compounds With Three or Fewer Detected Concentrations
MCRD Parris Island, South Carolina

Compound		Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)
Beryllium		3 / 11	380 - 416	393.66667	106 - 185
Methoxychlor	a	2 / 11	22.4 - 362	192.2	1.57 - 2.69
Methyl Acetate	a	1 / 11	3.3 - 3.3	3.3	0.62 - 2.1
Selenium	a	2 / 11	1620 - 1670	1645	771 - 1340

Notes:

NA = Not applicable

µg/kg = Micrograms per kilograms

a = Indicates compounds with less than three detections for consideration on a case-by-case basis

Sediment data are provided in Appendix C10

Sediment data that exclude outliers are provided in Appendix C12

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Appendix D
Polycyclic Aromatic Hydrocarbon (PAH) Calculations

Appendix D1:	**Soil PAH Dataset and Calculations**
Appendix D2:	**ProUCL Dataset for Soil PAH**
Appendix D3:	**Soil Statistics Summary for Derived PAH Parameters**
Appendix D4:	**Soil PAH Outlier Test Iterations**
Appendix D5:	**PAH ProUCL Output, Distribution Recommendations, Sediment UCL Calculations, Outliers Removed**
Appendix D6:	**PAH ProUCL Output Sediment BTV Calculations, Outliers Removed**

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Appendix D1
Soil PAH Dataset and Calculations

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Appendix D1
Soil PAH Dataset and Calculations
MCRD Parris Island, South Carolina

SAMPLES	HISTORICAL TOTAL_PAH	D_HISTORICAL TOTAL_PAH	ANTHRACENE	D_ANTHRACENE	CARBAZOLE	D_CARBAZOLE	PHENANTHRENE	D_PHENANTHRENE	LMW PAH Total	D_LMW PAH Total	BENZO(A)ANTHRACENE	D_BENZO(A)ANTHRACENE	BENZO(A)PYRENE	D_BENZO(A)PYRENE	BENZO(B)FLUORANTHENE	D_BENZO(B)FLUORANTHENE	BENZO(G,H,I)PERYLENE	D_BENZO(G,H,I)PERYLENE
BEA-BG-SB-SSB-01-03	1122	1	67	0	69	0	**92**	**1**	**160**	**1**	**150**	**1**	**160**	**1**	**190**	**1**	150	0
BEA-BG-SB-SSB-02-03	380	0	68	0	70	0	67	0	102.5	0	69	0	53	0	74	0	150	0
BEA-BG-SB-SSB-03-03	420	0	75	0	77	0	74	0	113	0	76	0	58	0	82	0	170	0
BEA-BG-SB-SSB-04-03	400	0	71	0	74	0	71	0	108	0	72	0	56	0	79	0	160	0
BEA-BG-SB-SSB-05-03	380	0	67	0	70	0	67	0	102	0	68	0	52	0	74	0	150	0
BEA-BG-SB-SSB-06-03	360	0	62	0	65	0	62	0	94.5	0	64	0	49	0	69	0	140	0
BEA-BG-SB-SSB-07-03	410	0	72	0	75	0	72	0	109.5	0	74	0	56	0	80	0	160	0
BEA-BG-SB-SSB-08-03	360	0	63	0	65	0	63	0	95.5	0	64	0	49	0	70	0	140	0
BEA-BG-SB-SSB-09-03	360	0	63	0	65	0	63	0	95.5	0	64	0	49	0	70	0	140	0
BEA-BG-SB-SSB-10-03	380	0	68	0	70	0	67	0	102.5	0	69	0	53	0	75	0	150	0
BEA-BG-SS-SSB-01-01	4087	1	**77**	**1**	67	0	**390**	**1**	**500.5**	**1**	**500**	**1**	**540**	**1**	**540**	**1**	**220**	**1**
BEA-BG-SS-SSB-02-01	142	1	64	0	66	0	64	0	97	0	65	0	**58**	**1**	**89**	**1**	140	0
BEA-BG-SS-SSB-03-01	370	0	65	0	67	0	65	0	98.5	0	66	0	51	0	72	0	140	0
BEA-BG-SS-SSB-03-01-D	370	0	64	0	67	0	64	0	97.5	0	66	0	50	0	71	0	140	0
BEA-BG-SS-SSB-04-01	460	0	80	0	83	0	80	0	121.5	0	82	0	63	0	89	0	180	0
BEA-BG-SS-SSB-04-01-D	410	0	72	0	75	0	72	0	109.5	0	74	0	56	0	80	0	160	0
BEA-BG-SS-SSB-05-01	370	0	64	0	67	0	64	0	97.5	0	66	0	50	0	71	0	140	0
BEA-BG-SS-SSB-06-01	370	0	65	0	67	0	64	0	98	0	66	0	50	0	71	0	140	0
BEA-BG-SS-SSB-07-01	400	0	70	0	72	0	70	0	106	0	71	0	55	0	77	0	160	0
BEA-BG-SS-SSB-08-01	380	0	66	0	68	0	66	0	100	0	67	0	52	0	73	0	150	0
BEA-BG-SS-SSB-09-01	370	0	65	0	67	0	64	0	98	0	66	0	51	0	71	0	140	0
BEA-BG-SS-SSB-10-01	370	0	65	0	68	0	65	0	99	0	66	0	51	0	72	0	140	0
SCS-01_0-1	25220	1	**590**	**1**	**450**	**1**	**3200**	**1**	**4240**	**1**	**2200**	**1**	**1400**	**1**	**1900**	**1**	**1100**	**1**
SCS-01_2-3	390	0	42	0	53	0	46	0	70.5	0	30	0	42	0	39	0	32	0
SCS-02_0-1	370	0	41	0	51	0	45	0	68.5	0	29	0	40	0	37	0	31	0
SCS-02_2-3	410	0	44	0	56	0	49	0	74.5	0	31	0	44	0	41	0	34	0
SCS-03_0-1	380	0	41	0	52	0	45	0	69	0	29	0	41	0	38	0	31	0
SCS-03_2-3	390	0	43	0	54	0	47	0	72	0	30	0	42	0	39	0	33	0
SCS-04_0-1	380	0	41	0	52	0	45	0	69	0	29	0	41	0	38	0	31	0
SCS-04_2-3	390	0	42	0	53	0	46	0	70.5	0	30	0	42	0	39	0	32	0
SCS-05_0-1	360	0	39	0	50	0	43	0	66	0	28	0	39	0	36	0	30	0
SCS-05_2-3	390	0	42	0	53	0	46	0	70.5	0	30	0	42	0	39	0	32	0
SCS-06_0-1	370	0	40	0	50	0	44	0	67	0	28	0	40	0	37	0	30	0
SCS-06_2-3	370	0	40	0	51	0	44	0	67.5	0	28	0	40	0	37	0	31	0
SCS-07_0-1	380	0	42	0	52	0	46	0	70	0	29	0	41	0	38	0	32	0
SCS-07_2-3	380	0	42	0	52	0	46	0	70	0	29	0	41	0	38	0	32	0
SCS-08_0-1	380	0	42	0	52	0	46	0	70	0	29	0	41	0	38	0	32	0
SCS-08_2-3	400	0	43	0	54	0	48	0	72.5	0	31	0	43	0	40	0	33	0
SCS-09_0-1	370	0	40	0	50	0	44	0	67	0	28	0	40	0	37	0	30	0
SCS-09_2-3	360	0	39	0	50	0	43	0	66	0	28	0	39	0	36	0	30	0
SCS-10_0-1	390	0	43	0	54	0	47	0	72	0	30	0	42	0	39	0	33	0
SCS-10_2-3	410	0	44	0	56	0	49	0	74.5	0	31	0	44	0	41	0	34	0
SSA-01_0-1	430	0	47	0	58	0	51	0	78	0	33	0	46	0	43	0	35	0
SSA-01_0-1-D	370	0	40	0	50	0	44	0	67	0	28	0	40	0	37	0	30	0
SSA-01_2-3	340	0	37	0	46	0	40	0	61.5	0	26	0	36	0	34	0	28	0
SSA-02_0-1	390	0	42	0	53	0	46	0	70.5	0	30	0	42	0	39	0	32	0
SSA-02_0-1-D	390	0	43	0	54	0	47	0	72	0	30	0	42	0	39	0	33	0
SSA-02_2-3	420	0	46	0	58	0	51	0	77.5	0	32	0	45	0	42	0	35	0
SSA-03_0-1	370	0	40	0	50	0	44	0	67	0	28	0	39	0	37	0	30	0
SSA-03_0-1-D	370	0	40	0	50	0	44	0	67	0	28	0	40	0	37	0	30	0
SSA-03_2-3	360	0	39	0	49	0	43	0	65.5	0	28	0	39	0	36	0	30	0
SSA-04_0-1	370	0	40	0	50	0	44	0	67	0	28	0	40	0	37	0	30	0
SSA-04_0-1-D	370	0	40	0	50	0	44	0	67	0	28	0	39	0	37	0	30	0
SSA-04_2-3	370	0	40	0	51	0	44	0	67.5	0	28	0	40	0	37	0	31	0
SSA-05_0-1	370	0	40	0	51	0	44	0	67.5	0	28	0	40	0	37	0	31	0
SSA-05_2-3	360	0	39	0	49	0	43	0	65.5	0	28	0	39	0	36	0	30	0
SSA-06_0-1	380	0	42	0	52	0	46	0	70	0	29	0	41	0	38	0	32	0
SSA-06_2-3	380	0	42	0	52	0	46	0	70	0	29	0	41	0	38	0	32	0
SSA-07_0-1	350	0	38	0	48	0	42	0	64	0	27	0	38	0	35	0	29	0
SSA-07_2-3	350	0	39	0	49	0	42	0	65	0	27	0	38	0	35	0	29	0
SSA-08_0-1	370	0	40	0	51	0	44	0	67.5	0	28	0	40	0	37	0	31	0
SSA-08_2-3	380	0	41	0	52	0	45	0	69	0	29	0	41	0	38	0	31	0
SSA-09_0-1	370	0	40	0	51	0	44	0	67.5	0	28	0	40	0	37	0	31	0
SSA-09_2-3	370	0	40	0	51	0	44	0	67.5	0	28	0	40	0	37	0	31	0
SSA-10_0-1	360	0	39	0	50	0	43	0	66	0	28	0	39	0	36	0	30	0
SSA-10_2-3	360	0	39	0	50	0	43	0	66	0	28	0	39	0	36	0	30	0

Notes:

PAH = Polycyclic Aromatic Hydrocarbon
LMW = Low Molecular Weight
HMW = High Molecular Weight
Units are microgram per kilogram (µg/kg)
Table formatted to allow direct input to ProUCL
Concentrations reported with a "1" in their corresponding "D_Parameter" column indicate detected concentrations.
Concentrations reported with at "0" in their corresponding "D_Parameter" column indicate non-detected concentrations; one-half the detection limit was used in the calculations.
HISTORICAL TOTAL_PAH values from Appendix A-1 for reference; not used in HMW or LMW PAH calculations.
LMW PAH, compounds or total
HMW PAH, compounds or total
Total PAH, calculated

Appendix D1
Soil PAH Dataset and Calculations
MCRD Parris Island, South Carolina

SAMPLES	BENZO(K)FLUORANTHENE	D_BENZO(K)FLUORANTHENE	CHRYSENE	D_CHRYSENE	DIBENZO(A,H)ANTHRACENE	D_DIBENZO(A,H)ANTHRACENE	FLUORANTHENE	D_FLUORANTHENE	INDENO(1,2,3-CD)PYRENE	D_INDENO(1,2,3-CD)PYRENE	PYRENE	D_PYRENE	HMW PAH Total	D_HMW PAH Total	New Total PAH	D_New Total PAH
BEA-BG-SB-SSB-01-03	**170**	**1**	**180**	**1**	160	0	**260**	**1**	150	0	**280**	**1**	**1620**	**1**	**1780**	**1**
BEA-BG-SB-SSB-02-03	68	0	76	0	160	0	83	0	150	0	84	0	483.5	0	586	0
BEA-BG-SB-SSB-03-03	76	0	85	0	180	0	91	0	170	0	93	0	540.5	0	653.5	0
BEA-BG-SB-SSB-04-03	72	0	81	0	170	0	87	0	160	0	88	0	512.5	0	620.5	0
BEA-BG-SB-SSB-05-03	68	0	76	0	160	0	82	0	150	0	83	0	481.5	0	583.5	0
BEA-BG-SB-SSB-06-03	63	0	71	0	150	0	76	0	140	0	78	0	450	0	544.5	0
BEA-BG-SB-SSB-07-03	73	0	82	0	180	0	88	0	160	0	90	0	521.5	0	631	0
BEA-BG-SB-SSB-08-03	64	0	72	0	150	0	77	0	140	0	78	0	452	0	547.5	0
BEA-BG-SB-SSB-09-03	64	0	71	0	150	0	77	0	140	0	78	0	451.5	0	547	0
BEA-BG-SB-SSB-10-03	68	0	77	0	160	0	83	0	160	0	84	0	489.5	0	592	0
BEA-BG-SS-SSB-01-01	**520**	**1**	**560**	**1**	160	0	**920**	**1**	**210**	**1**	**1100**	**1**	**5190**	**1**	**5690.5**	**1**
BEA-BG-SS-SSB-02-01	**66**	**1**	72	0	160	0	**84**	**1**	150	0	80	0	**630.5**	**1**	**727.5**	**1**
BEA-BG-SS-SSB-03-01	66	0	74	0	160	0	80	0	150	0	81	0	470	0	568.5	0
BEA-BG-SS-SSB-03-01-D	65	0	73	0	160	0	79	0	150	0	80	0	467	0	564.5	0
BEA-BG-SS-SSB-04-01	81	0	91	0	200	0	98	0	180	0	100	0	582	0	703.5	0
BEA-BG-SS-SSB-04-01-D	73	0	82	0	180	0	89	0	170	0	90	0	527	0	636.5	0
BEA-BG-SS-SSB-05-01	65	0	73	0	160	0	79	0	150	0	80	0	467	0	564.5	0
BEA-BG-SS-SSB-06-01	65	0	73	0	160	0	79	0	150	0	80	0	467	0	565	0
BEA-BG-SS-SSB-07-01	71	0	79	0	170	0	86	0	160	0	87	0	508	0	614	0
BEA-BG-SS-SSB-08-01	67	0	75	0	160	0	81	0	150	0	82	0	478.5	0	578.5	0
BEA-BG-SS-SSB-09-01	66	0	73	0	160	0	79	0	150	0	80	0	468	0	566	0
BEA-BG-SS-SSB-10-01	66	0	74	0	160	0	80	0	150	0	81	0	470	0	569	0
SCS-01_0-1	**1500**	**1**	**2500**	**1**	**550**	**1**	**5800**	**1**	**980**	**1**	**3500**	**1**	**21430**	**1**	**25670**	**1**
SCS-01_2-3	48	0	41	0	29	0	51	0	39	0	43	0	197	0	267.5	0
SCS-02_0-1	47	0	40	0	28	0	49	0	37	0	41	0	189.5	0	258	0
SCS-02_2-3	51	0	43	0	31	0	54	0	41	0	45	0	207.5	0	282	0
SCS-03_0-1	47	0	40	0	29	0	50	0	38	0	42	0	192.5	0	261.5	0
SCS-03_2-3	49	0	42	0	30	0	52	0	39	0	43	0	199.5	0	271.5	0
SCS-04_0-1	47	0	40	0	29	0	50	0	38	0	42	0	192.5	0	261.5	0
SCS-04_2-3	48	0	41	0	29	0	51	0	39	0	43	0	197	0	267.5	0
SCS-05_0-1	45	0	38	0	27	0	48	0	36	0	40	0	183.5	0	249.5	0
SCS-05_2-3	48	0	41	0	29	0	51	0	39	0	43	0	197	0	267.5	0
SCS-06_0-1	46	0	39	0	28	0	48	0	37	0	40	0	186.5	0	253.5	0
SCS-06_2-3	46	0	39	0	28	0	49	0	37	0	41	0	188	0	255.5	0
SCS-07_0-1	48	0	41	0	29	0	51	0	38	0	42	0	194.5	0	264.5	0
SCS-07_2-3	48	0	41	0	29	0	51	0	38	0	42	0	194.5	0	264.5	0
SCS-08_0-1	48	0	41	0	29	0	50	0	38	0	42	0	194	0	264	0
SCS-08_2-3	50	0	42	0	30	0	52	0	40	0	44	0	202.5	0	275	0
SCS-09_0-1	46	0	39	0	28	0	48	0	37	0	40	0	186.5	0	253.5	0
SCS-09_2-3	45	0	38	0	27	0	48	0	36	0	40	0	183.5	0	249.5	0
SCS-10_0-1	49	0	42	0	30	0	52	0	39	0	43	0	199.5	0	271.5	0
SCS-10_2-3	51	0	43	0	31	0	54	0	41	0	45	0	207.5	0	282	0
SSA-01_0-1	53	0	45	0	32	0	56	0	43	0	47	0	216.5	0	294.5	0
SSA-01_0-1-D	46	0	39	0	28	0	48	0	37	0	40	0	186.5	0	253.5	0
SSA-01_2-3	42	0	36	0	26	0	44	0	34	0	37	0	171.5	0	233	0
SSA-02_0-1	48	0	41	0	29	0	51	0	39	0	43	0	197	0	267.5	0
SSA-02_0-1-D	49	0	42	0	30	0	52	0	39	0	43	0	199.5	0	271.5	0
SSA-02_2-3	53	0	45	0	32	0	56	0	42	0	46	0	214	0	291.5	0
SSA-03_0-1	46	0	39	0	28	0	48	0	37	0	40	0	186	0	253	0
SSA-03_0-1-D	46	0	39	0	28	0	48	0	37	0	40	0	186.5	0	253.5	0
SSA-03_2-3	45	0	38	0	27	0	47	0	36	0	39	0	182.5	0	248	0
SSA-04_0-1	46	0	39	0	28	0	48	0	37	0	40	0	186.5	0	253.5	0
SSA-04_0-1-D	46	0	39	0	28	0	48	0	37	0	40	0	186	0	253	0
SSA-04_2-3	46	0	39	0	28	0	49	0	37	0	41	0	188	0	255.5	0
SSA-05_0-1	46	0	39	0	28	0	49	0	37	0	41	0	188	0	255.5	0
SSA-05_2-3	45	0	38	0	27	0	47	0	36	0	39	0	182.5	0	248	0
SSA-06_0-1	48	0	41	0	29	0	50	0	38	0	42	0	194	0	264	0
SSA-06_2-3	48	0	41	0	29	0	51	0	38	0	42	0	194.5	0	264.5	0
SSA-07_0-1	44	0	37	0	27	0	46	0	35	0	39	0	178.5	0	242.5	0
SSA-07_2-3	44	0	38	0	27	0	47	0	35	0	39	0	179.5	0	244.5	0
SSA-08_0-1	46	0	39	0	28	0	49	0	37	0	41	0	188	0	255.5	0
SSA-08_2-3	47	0	40	0	29	0	50	0	38	0	42	0	192.5	0	261.5	0
SSA-09_0-1	46	0	39	0	28	0	49	0	37	0	41	0	188	0	255.5	0
SSA-09_2-3	46	0	39	0	28	0	49	0	37	0	41	0	188	0	255.5	0
SSA-10_0-1	45	0	38	0	27	0	48	0	36	0	40	0	183.5	0	249.5	0
SSA-10_2-3	45	0	38	0	27	0	48	0	36	0	40	0	183.5	0	249.5	0

Appendix D2
ProUCL Dataset for Soil PAH

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Appendix D2
ProUCL Dataset for Soil PAH
MCRD Parris Island, South Carolina

SAMPLES	TOTAL_PAH	D_TOTAL_PAH	HMW PAH Total	D_HMW PAH Total	LMW PAH Total	D_LMW PAH Total	New Total PAH	D_New Total PAH
BEA-BG-SB-SSB-01-03	**1122**	**1**	**1620**	**1**	**160**	**1**	**1780**	**1**
BEA-BG-SB-SSB-02-03	380	0	483.5	0	102.5	0	586	0
BEA-BG-SB-SSB-03-03	420	0	540.5	0	113	0	653.5	0
BEA-BG-SB-SSB-04-03	400	0	512.5	0	108	0	620.5	0
BEA-BG-SB-SSB-05-03	380	0	481.5	0	102	0	583.5	0
BEA-BG-SB-SSB-06-03	360	0	450	0	94.5	0	544.5	0
BEA-BG-SB-SSB-07-03	410	0	521.5	0	109.5	0	631	0
BEA-BG-SB-SSB-08-03	360	0	452	0	95.5	0	547.5	0
BEA-BG-SB-SSB-09-03	360	0	451.5	0	95.5	0	547	0
BEA-BG-SB-SSB-10-03	380	0	489.5	0	102.5	0	592	0
BEA-BG-SS-SSB-01-01	**4087**	**1**	**5190**	**1**	**500.5**	**1**	**5690.5**	**1**
BEA-BG-SS-SSB-02-01	**142**	**1**	**630.5**	**1**	97	0	**727.5**	**1**
BEA-BG-SS-SSB-03-01	370	0	470	0	98.5	0	568.5	0
BEA-BG-SS-SSB-03-01-D	370	0	467	0	97.5	0	564.5	0
BEA-BG-SS-SSB-04-01	460	0	582	0	121.5	0	703.5	0
BEA-BG-SS-SSB-04-01-D	410	0	527	0	109.5	0	636.5	0
BEA-BG-SS-SSB-05-01	370	0	467	0	97.5	0	564.5	0
BEA-BG-SS-SSB-06-01	370	0	467	0	98	0	565	0
BEA-BG-SS-SSB-07-01	400	0	508	0	106	0	614	0
BEA-BG-SS-SSB-08-01	380	0	478.5	0	100	0	578.5	0
BEA-BG-SS-SSB-09-01	370	0	468	0	98	0	566	0
BEA-BG-SS-SSB-10-01	370	0	470	0	99	0	569	0
SCS-01_0-1	**25220**	**1**	**21430**	**1**	**4240**	**1**	**25670**	**1**
SCS-01_2-3	390	0	197	0	70.5	0	267.5	0
SCS-02_0-1	370	0	189.5	0	68.5	0	258	0
SCS-02_2-3	410	0	207.5	0	74.5	0	282	0
SCS-03_0-1	380	0	192.5	0	69	0	261.5	0
SCS-03_2-3	390	0	199.5	0	72	0	271.5	0
SCS-04_0-1	380	0	192.5	0	69	0	261.5	0
SCS-04_2-3	390	0	197	0	70.5	0	267.5	0
SCS-05_0-1	360	0	183.5	0	66	0	249.5	0
SCS-05_2-3	390	0	197	0	70.5	0	267.5	0
SCS-06_0-1	370	0	186.5	0	67	0	253.5	0
SCS-06_2-3	370	0	188	0	67.5	0	255.5	0
SCS-07_0-1	380	0	194.5	0	70	0	264.5	0
SCS-07_2-3	380	0	194.5	0	70	0	264.5	0
SCS-08_0-1	380	0	194	0	70	0	264	0
SCS-08_2-3	400	0	202.5	0	72.5	0	275	0
SCS-09_0-1	370	0	186.5	0	67	0	253.5	0
SCS-09_2-3	360	0	183.5	0	66	0	249.5	0
SCS-10_0-1	390	0	199.5	0	72	0	271.5	0
SCS-10_2-3	410	0	207.5	0	74.5	0	282	0
SSA-01_0-1	430	0	216.5	0	78	0	294.5	0
SSA-01_0-1-D	370	0	186.5	0	67	0	253.5	0
SSA-01_2-3	340	0	171.5	0	61.5	0	233	0
SSA-02_0-1	390	0	197	0	70.5	0	267.5	0
SSA-02_0-1-D	390	0	199.5	0	72	0	271.5	0
SSA-02_2-3	420	0	214	0	77.5	0	291.5	0
SSA-03_0-1	370	0	186	0	67	0	253	0
SSA-03_0-1-D	370	0	186.5	0	67	0	253.5	0
SSA-03_2-3	360	0	182.5	0	65.5	0	248	0
SSA-04_0-1	370	0	186.5	0	67	0	253.5	0
SSA-04_0-1-D	370	0	186	0	67	0	253	0
SSA-04_2-3	370	0	188	0	67.5	0	255.5	0
SSA-05_0-1	370	0	188	0	67.5	0	255.5	0
SSA-05_2-3	360	0	182.5	0	65.5	0	248	0
SSA-06_0-1	380	0	194	0	70	0	264	0
SSA-06_2-3	380	0	194.5	0	70	0	264.5	0
SSA-07_0-1	350	0	178.5	0	64	0	242.5	0
SSA-07_2-3	350	0	179.5	0	65	0	244.5	0
SSA-08_0-1	370	0	188	0	67.5	0	255.5	0
SSA-08_2-3	380	0	192.5	0	69	0	261.5	0
SSA-09_0-1	370	0	188	0	67.5	0	255.5	0
SSA-09_2-3	370	0	188	0	67.5	0	255.5	0
SSA-10_0-1	360	0	183.5	0	66	0	249.5	0
SSA-10_2-3	360	0	183.5	0	66	0	249.5	0

Notes:
Units are in micrograms per kilogram
Concentrations reported with at "0" in their corresponding "D_Parameter" column are non-detects.
Concentrations reported with a "1" in their corresponding "D_Parameter" Column are positive detects.
LMW = Low Molecular Weight (Up to three benzene rings)
HMW = High Molecular Weight (four benzene rings or more)
Values determined to be outliers by ProUCL are highlighted yellow.
Compound "TOTAL_PAH" republished from Appendix A1 for reference, only. "New Total PAH" was used to determine a BTV for Total PAH.

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Appendix D3
Soil Statistics Summary for Derived PAH Parameters

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Appendix D3
Soil Statistics Summary for Derived PAH Parameters
MCRD Parris Island, South Carolina

Compound	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)
LMW PAH, With Outliers	3 / 66	160 - 4240	7217.6	171.5 - 582
HMW PAH, With Outliers	4 / 66	630 - 21430	1633.5	61.5 - 121.5
New Total PAH, With Outliers	4 / 66	727 - 25670	8467.0	223 - 703.5

Compound	Frequency of Detection	Range of Detected Concentrations (µg/kg)	Arithmetic Mean (µg/kg)	Range of detection limits (µg/kg)
LMW PAH, Outliers Removed	2 / 65	160 - 500.5	330.50	171.5 - 582
HMW PAH, Outliers Removed	3 / 65	630 - 5190	2480.18	61.5 - 121.5
New Total PAH, Outliers Removed	3 / 65	727 - 5690.5	2732.67	223 - 703.5

Notes:

µg/kg = Micrograms per kilogram

PAH = Polycyclic Aromatic Hydrocarbon

LMW = Low Molecular Weight (up to three benzene rings)

HMW = High Molecular Weight (four benzene rings or more)

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Appendix D4
Soil PAH Outlier Test Iterations

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Appendix D4
Soil PAH Outlier Test Iterations

OUTLIER ITERATION 1

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation 5/28/2015 9:23:59 AM
From File 20 D1 Soil ProUCL PAH Dataset 05.28.2015.xls
Full Precision ON

Dixon's Outlier Test for HMW PAH Total

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 21430 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.781

For 10% significance level, 21430 is an outlier.
For 5% significance level, 21430 is an outlier.
For 1% significance level, 21430 is not an outlier.

2. Data Value 630.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.048

For 10% significance level, 630.5 is not an outlier.
For 5% significance level, 630.5 is not an outlier.
For 1% significance level, 630.5 is not an outlier.

Dixon's Outlier Test for LMW PAH Total

Total N = 66
Number NDs = 63
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

Appendix D4
Soil PAH Outlier Test Iterations

1. Data Value 4240 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.917

For 10% significance level, 4240 is an outlier.
For 5% significance level, 4240 is not an outlier.
For 1% significance level, 4240 is not an outlier.

2. Data Value 160 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.083

For 10% significance level, 160 is not an outlier.
For 5% significance level, 160 is not an outlier.
For 1% significance level, 160 is not an outlier.

Dixon's Outlier Test for New Total PAH

Total N = 66
Number NDs = 62
Number Detects = 4
10% critical value: 0.679
5% critical value: 0.765
1% critical value: 0.889
Note: NDs excluded from Outlier Test

1. Data Value 25670 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.801

For 10% significance level, 25670 is an outlier.
For 5% significance level, 25670 is an outlier.
For 1% significance level, 25670 is not an outlier.

2. Data Value 727.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.042

For 10% significance level, 727.5 is not an outlier.
For 5% significance level, 727.5 is not an outlier.
For 1% significance level, 727.5 is not an outlier.

Appendix D4
Soil PAH Outlier Test Iterations

OUTLIER ITERATION 2

Outlier Tests for Selected Variables excluding nondetects

User Selected Options

Date/Time of Computation	42152.39236
From File	20 D1 Soil ProUCL PAH Dataset 05.28.2015.xls
Full Precision	ON

Dixon's Outlier Test for HMW PAH Total

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

1. Data Value 5190 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.783

For 10% significance level, 5190 is not an outlier.
For 5% significance level, 5190 is not an outlier.
For 1% significance level, 5190 is not an outlier.

2. Data Value 630.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.217

For 10% significance level, 630.5 is not an outlier.
For 5% significance level, 630.5 is not an outlier.
For 1% significance level, 630.5 is not an outlier.

No Outlier Test for LMW PAH Total

Dixon's Outlier Test for New Total PAH

Total N = 65
Number NDs = 62
Number Detects = 3
10% critical value: 0.886
5% critical value: 0.941
1% critical value: 0.988
Note: NDs excluded from Outlier Test

Appendix D4
Soil PAH Outlier Test Iterations

1. Data Value 5690.5 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.788

For 10% significance level, 5690.5 is not an outlier.
For 5% significance level, 5690.5 is not an outlier.
For 1% significance level, 5690.5 is not an outlier.

2. Data Value 727.5 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.212

For 10% significance level, 727.5 is not an outlier.
For 5% significance level, 727.5 is not an outlier.
For 1% significance level, 727.5 is not an outlier.

Appendix D5
PAH ProUCL Output, Distribution Recommendations, Sediment UCL Calculations, Outliers Removed

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UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	5/28/2015 9:25:50 AM
From File	20 D1 Soil ProUCL PAH Dataset 05.28.2015.xls
Full Precision	ON
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

HMW PAH Total

General Statistics

Total Number of Observations	65.000000	Number of Distinct Observations	37.000000
		Number of Missing Observations	1.0000000
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	34.000000
Minimum Detect	630.50000	Minimum Non-Detect	171.50000
Maximum Detect	5190.0000	Maximum Non-Detect	582.00000
Variance Detects	5752175.1	Percent Non-Detects	95.384615%
Mean Detects	2480.1667	SD Detects	2398.3693
Median Detects	1620.0000	CV Detects	0.9670194
Skewness Detects	1.4063164	Kurtosis Detects	N/A
Mean of Logged Detects	7.4637279	SD of Logged Detects	1.0559107

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9035122	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3067369	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	278.05385	Standard Error of Mean	97.464028
SD	641.58678	95% KM (BCA) UCL	N/A
95% KM (t) UCL	440.72258	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	438.36791	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	570.44593	95% KM Chebyshev UCL	702.88970
97.5% KM Chebyshev UCL	886.71651	99% KM Chebyshev UCL	1247.8087

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.5648747	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1584.8979	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.3892485	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.1878222	nu hat (KM)	24.416891
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (24.42, α)	14.166122	Adjusted Chi Square Value (24.42, β)	13.988625
95% Gamma Approximate KM-UCL (use when n>=50)	479.25680	95% Gamma Adjusted KM-UCL (use when n<50)	485.33793

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9963423	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1944314	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	115.15574	Mean in Log Scale	-1.697999
SD in Original Scale	674.26217	SD in Log Scale	2.8698452
95% t UCL (assumes normality of ROS data)	254.73852	95% Percentile Bootstrap UCL	269.73016
95% BCA Bootstrap UCL	419.16790	95% Bootstrap t UCL	1021.7562
95% H-UCL (Log ROS)	41.903281		

UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	5.2516207	95% H-UCL (KM -Log)	247.00817
KM SD (logged)	0.5206576	95% Critical H Value (KM-Log)	1.8785247
KM Standard Error of Mean (logged)	0.0790936		

DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	249.24615	Mean in Log Scale	4.9681487
SD in Original Scale	654.97320	SD in Log Scale	0.7239063
95% t UCL (Assumes normality)	384.83581	95% H-Stat UCL	224.51341
DL/2 is not a recommended method, provided for comparisons and historical reasons			

Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	440.72258	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

LMW PAH Total

General Statistics			
Total Number of Observations	65.000000	Number of Distinct Observations	33.000000
		Number of Missing Observations	1.0000000
Number of Detects	2.0000000	Number of Non-Detects	63.000000

Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	31.000000
Minimum Detect	160.00000	Minimum Non-Detect	61.500000
Maximum Detect	500.50000	Maximum Non-Detect	121.50000
Variance Detects	57970.125	Percent Non-Detects	96.923077%
Mean Detects	330.25000	SD Detects	240.76986
Median Detects	330.25000	CV Detects	0.7290533
Skewness Detects	N/A	Kurtosis Detects	N/A
Mean of Logged Detects	5.6453907	SD of Logged Detects	0.8064085

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	69.769231	Standard Error of Mean	9.6807877
SD	55.188981	95% KM (BCA) UCL	N/A
95% KM (t) UCL	85.926592	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	85.692710	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	98.811594	95% KM Chebyshev UCL	111.96681
97.5% KM Chebyshev UCL	130.22573	99% KM Chebyshev UCL	166.09185

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3.3947024	k star (bias corrected MLE)	N/A
Theta hat (MLE)	97.283933	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	13.578810	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A

Gamma Kaplan-Meier (KM) Statistics

k hat (KM)	1.5981705	nu hat (KM)	207.76217
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (207.76, α)	175.40770	Adjusted Chi Square Value (207.76, β)	174.73690
95% Gamma Approximate KM-UCL (use when n>=50)	82.638369	95% Gamma Adjusted KM-UCL (use when n<50)	82.955611

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Lognormal ROS Statistics Using Imputed Non-Detects

Mean in Original Scale	10.321311	Mean in Log Scale	-3.341603
SD in Original Scale	64.854110	SD in Log Scale	2.6005976
95% t UCL (assumes normality of ROS data)	23.747122	95% Percentile Bootstrap UCL	25.689199
95% BCA Bootstrap UCL	38.406752	95% Bootstrap t UCL	1890.3212
95% H-UCL (Log ROS)	3.0561100		

DL/2 Statistics

DL/2 Normal	DL/2 Log-Transformed

Mean in Original Scale	48.665385	Mean in Log Scale	3.7238518
SD in Original Scale	59.391219	SD in Log Scale	0.4065187
95% t UCL (Assumes normality)	60.960293	95% H-Stat UCL	49.323223

DL/2 is not a recommended method, provided for comparisons and historical reasons

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution at 5% Significance Level

Suggested UCL to Use

95% KM (t) UCL	85.926592	95% KM (% Bootstrap) UCL	N/A

Warning: One or more Recommended UCL(s) not available!

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.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

New Total PAH

General Statistics

Total Number of Observations	65.000000	Number of Distinct Observations	39.000000
		Number of Missing Observations	1.0000000
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	36.000000
Minimum Detect	727.50000	Minimum Non-Detect	233.00000
Maximum Detect	5690.5000	Maximum Non-Detect	703.50000
Variance Detects	6838522.6	Percent Non-Detects	95.384615%
Mean Detects	2732.6667	SD Detects	2615.0569
Median Detects	1780.0000	CV Detects	0.9569615
Skewness Detects	1.4217860	Kurtosis Detects	N/A
Mean of Logged Detects	7.5735120	SD of Logged Detects	1.0313631

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9004466	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3088499	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	348.36923	Standard Error of Mean	105.84720
SD	696.77158	95% KM (BCA) UCL	N/A
95% KM (t) UCL	525.02959	95% KM (Percentile Bootstrap) UCL	N/A
95% KM (z) UCL	522.47238	95% KM Bootstrap t UCL	N/A
90% KM Chebyshev UCL	665.91084	95% KM Chebyshev UCL	809.74649
97.5% KM Chebyshev UCL	1009.3848	99% KM Chebyshev UCL	1401.5356

Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.6192441	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1687.6187	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.7154648	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A	MLE Sd (bias corrected)	N/A
Gamma Kaplan-Meier (KM) Statistics			
k hat (KM)	0.2499762	nu hat (KM)	32.496910
		Adjusted Level of Significance (β)	0.0463077
Approximate Chi Square Value (32.50, α)	20.466486	Adjusted Chi Square Value (32.50, β)	20.249640
95% Gamma Approximate KM-UCL (use when n>=50)	553.14447	95% Gamma Adjusted KM-UCL (use when n<50)	559.06790
Lognormal GOF Test on Detected Observations Only			
Shapiro Wilk Test Statistic	0.9943780	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.2011054	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level	
Detected Data appear Lognormal at 5% Significance Level			
Lognormal ROS Statistics Using Imputed Non-Detects			
Mean in Original Scale	126.97030	Mean in Log Scale	-1.381226
SD in Original Scale	739.84671	SD in Log Scale	2.7589135
95% t UCL (assumes normality of ROS data)	280.13010	95% Percentile Bootstrap UCL	301.79579
95% BCA Bootstrap UCL	444.40625	95% Bootstrap t UCL	1072.5141
95% H-UCL (Log ROS)	37.829844		
UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed			
KM Mean (logged)	5.5489988	95% H-UCL (KM -Log)	322.41655
KM SD (logged)	0.4806782	95% Critical H Value (KM-Log)	1.8527129
KM Standard Error of Mean (logged)	0.0730203		
DL/2 Statistics			
DL/2 Normal		**DL/2 Log-Transformed**	
Mean in Original Scale	298.65769	Mean in Log Scale	5.2320560
SD in Original Scale	714.58826	SD in Log Scale	0.6660728
95% t UCL (Assumes normality)	446.58860	95% H-Stat UCL	275.63966
DL/2 is not a recommended method, provided for comparisons and historical reasons			
Nonparametric Distribution Free UCL Statistics			
Detected Data appear Normal Distributed at 5% Significance Level			
Suggested UCL to Use			
95% KM (t) UCL	525.02959	95% KM (Percentile Bootstrap) UCL	N/A
Warning: One or more Recommended UCL(s) not available!			
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.			
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).			

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Appendix D6
PAH ProUCL Output Sediment BTV Calculations, Outliers Removed

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	Background Statistics for Data Sets with Non-Detects
User Selected Options	
Date/Time of Computation	5/28/2015 9:25:22 AM
From File	20 D1 Soil ProUCL PAH Dataset 05.28.2015.xls
Full Precision	ON
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

HMW PAH Total

General Statistics

Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	37.000000		
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	34.000000
Minimum Detect	630.50000	Minimum Non-Detect	171.50000
Maximum Detect	5190.0000	Maximum Non-Detect	582.00000
Variance Detected	5752175.1	Percent Non-Detects	95.384615%
Mean Detected	2480.1667	SD Detected	2398.3693
Mean of Detected Logged Data	7.4637279	SD of Detected Logged Data	1.0559107

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.9035122	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3067369	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	278.05385	SD	641.58678
95% UTL95% Coverage	1561.2715	95% KM UPL (t)	1357.0761
90% KM Percentile (z)	1100.2804	95% KM Percentile (z)	1333.3702
99% KM Percentile (z)	1770.6079	95% KM USL	2239.1993

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	249.24615	SD	654.97320
95% UTL95% Coverage	1559.2376	95% UPL (t)	1350.7818
90% Percentile (z)	1088.6281	95% Percentile (z)	1326.5812
99% Percentile (z)	1772.9417	95% USL	2251.3100

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	1.5648747	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1584.8979	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.3892485	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

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 detected data is small such as < 0.1

For such situations, GROS method tends to yield inflated values of UCLs and BTVs

For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.0100000	Mean	114.47877
Maximum	5190.0000	Median	0.0100000
SD	674.37680	CV	5.8908460
k hat (MLE)	0.0932153	k star (bias corrected MLE)	0.0991694
Theta hat (MLE)	1228.1116	Theta star (bias corrected MLE)	1154.3754
nu hat (MLE)	12.117987	nu star (bias corrected)	12.892028
MLE Mean (bias corrected)	114.47877	MLE Sd (bias corrected)	363.52644
95% Percentile of Chisquare (2k)	1.1517693	90% Percentile	303.62850
95% Percentile	664.78706	99% Percentile	1826.0686

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	241.58837	124.70361	95% Approx. Gamma UPL	154.15497	71.367687
95% Gamma USL	754.57839	524.90602			

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

k hat (KM)	0.1878222	nu hat (KM)	24.416891

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	777.81265	707.09639	95% Approx. Gamma UPL	651.38735	592.62723
95% Gamma USL	1312.7579	1208.5279			

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.9963423	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.1944314	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	115.15574	Mean in Log Scale	-1.697999
SD in Original Scale	674.26217	SD in Log Scale	2.8698452
95% UTL95% Coverage	56.933797	95% BCA UTL95% Coverage	1422.1000
95% Bootstrap (%) UTL95% Coverage	1620.0000	95% UPL (t)	22.840025
90% Percentile (z)	7.2417003	95% Percentile (z)	20.542105
99% Percentile (z)	145.22143	95% USL	1181.2035

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	5.2516207	95% KM UTL (Lognormal)95% Coverage	540.75795
KM SD of Logged Data	0.5206576	95% KM UPL (Lognormal)	458.18088
95% KM Percentile Lognormal (z)	449.45075	95% KM USL (Lognormal)	937.40991

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	249.24615	Mean in Log Scale	4.9681487
SD in Original Scale	654.97320	SD in Log Scale	0.7239063
95% UTL95% Coverage	611.55876	95% UPL (t)	485.71214
90% Percentile (z)	363.53367	95% Percentile (z)	472.89273
99% Percentile (z)	774.49140	95% USL	1314.1181

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	1620.0000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	615.95000	95% USL	5190.0000
95% KM Chebyshev UPL	3096.0961		

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

LMW PAH Total

General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	33.000000		
Number of Detects	2.0000000	Number of Non-Detects	63.000000
Number of Distinct Detects	2.0000000	Number of Distinct Non-Detects	31.000000
Minimum Detect	160.00000	Minimum Non-Detect	61.500000
Maximum Detect	500.50000	Maximum Non-Detect	121.50000
Variance Detected	57970.125	Percent Non-Detects	96.923077%
Mean Detected	330.25000	SD Detected	240.76986
Mean of Detected Logged Data	5.6453907	SD of Detected Logged Data	0.8064085

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

Mean	69.769231	SD	55.188981
95% UTL95% Coverage	180.15099	95% KM UPL (t)	162.58620
90% KM Percentile (z)	140.49676	95% KM Percentile (z)	160.54703
99% KM Percentile (z)	198.15800	95% KM USL	238.46600

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	48.665385	SD	59.391219
95% UTL95% Coverage	167.45191	95% UPL (t)	148.54969
90% Percentile (z)	124.77829	95% Percentile (z)	146.35525
99% Percentile (z)	186.83002	95% USL	230.20719

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	3.3947024	k star (bias corrected MLE)	N/A
Theta hat (MLE)	97.283933	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	13.578810	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	k hat (KM)	1.5981705		nu hat (KM)	207.76217
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	130.66036	125.81461	95% Approx. Gamma UPL	118.25528	114.11315
95% Gamma USL	178.01062	171.19664			

Lognormal GOF Test on Detected Observations Only

Not Enough Data to Perform GOF Test

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	10.321311	Mean in Log Scale	-3.341603
SD in Original Scale	64.854110	SD in Log Scale	2.6005976
95% UTL95% Coverage	6.4222640	95% BCA UTL95% Coverage	128.46495
95% Bootstrap (%) UTL95% Coverage	160.00000	95% UPL (t)	2.8069218
90% Percentile (z)	0.9912353	95% Percentile (z)	2.5497596
99% Percentile (z)	15.003618	95% USL	100.25052

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	48.665385	Mean in Log Scale	3.7238518
SD in Original Scale	59.391219	SD in Log Scale	0.4065187
95% UTL95% Coverage	93.402409	95% UPL (t)	82.067000
90% Percentile (z)	69.743657	95% Percentile (z)	80.843529
99% Percentile (z)	106.65035	95% USL	143.51822

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	160.00000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	118.95000	95% USL	500.50000
95% KM Chebyshev UPL	312.17585		

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

New Total PAH

General Statistics			
Total Number of Observations	65.000000	Number of Missing Observations	1.0000000
Number of Distinct Observations	39.000000		
Number of Detects	3.0000000	Number of Non-Detects	62.000000
Number of Distinct Detects	3.0000000	Number of Distinct Non-Detects	36.000000
Minimum Detect	727.50000	Minimum Non-Detect	233.00000
Maximum Detect	5690.5000	Maximum Non-Detect	703.50000
Variance Detected	6838522.6	Percent Non-Detects	95.384615%
Mean Detected	2732.6667	SD Detected	2615.0569
Mean of Detected Logged Data	7.5735120	SD of Detected Logged Data	1.0313631

Warning: Data set has only 3 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.0000688	d2max (for USL)	3.0567111

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.9004466	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.3088499	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
Mean	348.36923	SD	696.77158
95% UTL95% Coverage	1741.9603	95% KM UPL (t)	1520.2015
90% KM Percentile (z)	1241.3179	95% KM Percentile (z)	1494.4565
99% KM Percentile (z)	1969.3023	95% KM USL	2478.1987

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	298.65769	SD	714.58826
95% UTL95% Coverage	1727.8833	95% UPL (t)	1500.4541
90% Percentile (z)	1214.4394	95% Percentile (z)	1474.0508
99% Percentile (z)	1961.0386	95% USL	2482.9476

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only			
Not Enough Data to Perform GOF Test			
Gamma Statistics on Detected Data Only			
k hat (MLE)	1.6192441	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1687.6187	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	9.7154648	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2k)	N/A
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 detected data is small such as < 0.1			
For such situations, GROS method tends to yield inflated values of UCLs and BTVs			
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates			
Minimum	0.0100000	Mean	126.13262
Maximum	5690.5000	Median	0.0100000
SD	739.98874	CV	5.8667517
k hat (MLE)	0.0923552	k star (bias corrected MLE)	0.0983491
Theta hat (MLE)	1365.7333	Theta star (bias corrected MLE)	1282.4990
nu hat (MLE)	12.006180	nu star (bias corrected)	12.785382
MLE Mean (bias corrected)	126.13262	MLE Sd (bias corrected)	402.20015
95% Percentile of Chisquare (2k)	1.1427430	90% Percentile	333.35663
95% Percentile	732.78340	99% Percentile	2020.3194

The following statistics are computed using Gamma ROS Statistics on Imputed Data					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	266.56521	137.40196	95% Approx. Gamma UPL	170.00972	78.522061
95% Gamma USL	833.38309	580.03271			

The following statistics are computed using gamma distribution and KM estimates					
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods					
k hat (KM)	0.2499762		nu hat (KM)		32.496910
	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	924.57662	850.10767	95% Approx. Gamma UPL	784.07180	721.83432
95% Gamma USL	1509.4609	1400.9672			

Lognormal GOF Test on Detected Observations Only		
Shapiro Wilk Test Statistic	0.9943780	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.7670000	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.2011054	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.5115323	Detected Data appear Lognormal at 5% Significance Level
Detected Data appear Lognormal at 5% Significance Level		

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects			
Mean in Original Scale	126.97030	Mean in Log Scale	-1.381226
SD in Original Scale	739.84671	SD in Log Scale	2.7589135
95% UTL95% Coverage	62.601612	95% BCA UTL95% Coverage	1569.5000
95% Bootstrap (%) UTL95% Coverage	1569.5000	95% UPL (t)	26.016271
90% Percentile (z)	8.6232686	95% Percentile (z)	23.494896
99% Percentile (z)	154.00220	95% USL	1155.1390

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution			
KM Mean of Logged Data	5.5489988	95% KM UTL (Lognormal)95% Coverage	672.08724
KM SD of Logged Data	0.4806782	95% KM UPL (Lognormal)	576.74749
95% KM Percentile Lognormal (z)	566.59456	95% KM USL (Lognormal)	1116.8785

Background DL/2 Statistics Assuming Lognormal Distribution			
Mean in Original Scale	298.65769	Mean in Log Scale	5.2320560
SD in Original Scale	714.58826	SD in Log Scale	0.6660728
95% UTL95% Coverage	709.27784	95% UPL (t)	573.78737
90% Percentile (z)	439.51093	95% Percentile (z)	559.83841
99% Percentile (z)	881.45413	95% USL	1433.7491

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)			
Order of Statistic, r	64.000000	95% UTL with95% Coverage	1780.0000
Approximate f	1.6842105	Confidence Coefficient (CC) achieved by UTL	0.8423986
95% UPL	720.30000	95% USL	5690.5000
95% KM Chebyshev UPL	3408.7997		

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

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Appendix E
Response to Comments

Appendix E1:	**Response to SCDHEC Comments, Draft ProUCL Background Evaluation — Dated 22 March 2016**
Appendix E2:	**Response to U.S. EPA Comments, Draft ProUCL Background Evaluation — Dated 13 January 2015**
Appendix E3:	**Response to U.S. EPA Comments, Draft ProUCL Background Evaluation — Dated 22 March 2016**
Appendix E4:	**Summary Notes from 30 April 2015 ProUCL Teleconference — Dated 22 March 2016**

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Appendix E1
Response to SCDHEC Comments, Draft ProUCL Background Evaluation
Dated 22 March 2016

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RESPONSE TO COMMENTS
DRAFT PROUCL BACKGROUND EVALUATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA,
DATED 22 MARCH 2016

Responses to South Carolina Department of Health and Environmental Control comments, dated 2 December 2014

1. **Comment:**
In table 2 please remove the duplicate BTV column.

Response:
Document revised accordingly.

2. **Comment:**
Please provide the comparison summary table of the 2006 MCAS Background Study Values to the 2014 ProUCL Background Threshold Values. The referenced table is attached to this letter.

Response:
See attached summary table which compares the 2006 MCAS Background Study Values to the new (2016) background threshold values.

RESOLUTION CONSULTANTS

INFORMAL SUMMARY TABLE
ProUCL Background Evaluation - MCRD Parris Island, South Carolina
UPDATED MARCH 2016

Soil	2006 MCAS Background Study	2016 ProUCL Background Threshold Value
2,4'-D	13.7	--
4,4'-DDD	1.8	--
4,4'-DDE	2.9	6.4
4,4'-DDT	2.8	3.6
Alpha-Chlordane	26.7	5.2
Aluminum	4,778,000	9,200,000
Anthracene	206	--
Arsenic	1,160	2,190
Barium	12,900	32,000
Benzaldehyde	1,160	--
Benzo(a)anthracene	1,900	2,200
Benzo(a)pyrene	1,080	609
Benzo(b)fluoranthene	1,360	540
benzo(g,h,i)perylene	1,320	--
Benzo(k)fluoranthene	1,130	520
Beryllium	288	247
Cadmium	320	171
Calcium	1,880,000	3,530,000
Carbazole	900	--
Carbon Disulfide	83.4	100
Chromium	5,170	11,200
Chrysene	299	2,500
Cobalt	1,200	632
Copper	2,500	5,281
Dalapon	25	--
Dibenzo(a,h)anthracene	205	--
Dichlorodifluoromethane	2.8	--
Endosulfine Sulfate	2.8	13.6
Endrin	2.6	--
Endrin Aldehyde	2.7	--
Fluoranthene	705	920
Gamma-Chlordane	18.7	--
Heptachlor	1	--
Indeno(1,2,3-CD)Pyrene	225	--
Iron	2,875,000	5,900,000
Lead	6,920	9,150
Magnesium	278,000	375,000
Manganese	19,200	32,320
Mercury	248	506
Methoxychlor	13.5	--
Methyl Acetate	3	--
Nickel	1,650	2,777
Phenanthrene	325	390
Potassium	105,000	162,000
Pyrene	356	3,500
Selenium	595	1,300
Silver	990	986
Sodium	491,000	121,000
Thallium	682	386
Total DDD/DDE/DDT	2.2	9
Total PAHs	628	5,690
High Molecular Weight PAHs	--	5,190
Low Molecular Weight PAHs	--	500
Trichlorofluoromethane	4.8	4.2
Vanadium	8,220	12,100
Zinc	4,270	45,100

Sediment	2006 MCAS Background Study	2016 ProUCL Background Threshold Value
Aluminum	5,803,000	11,600,000
Arsenic	3,980	6,720
Barium	10,900	14,500
Beryllium	416	416
Calcium	1,392,000	2,190,000
Carbon Disulfide	998	1,840
Chromium	9,250	16,700
Cobalt	4,860	2,440
Copper	12,100	12,600
Endrin Ketone	57.9	18.3
Indeno(1,2,3-cd)pyrene	--	--
Iron	6,560,000	12,300,000
Lead	7,990	13,300
Magnesium	2,423,000	4,110,000
Manganese	43,100	70,100
Mercury	190	330
Methoxychlor	-	--
Methyl Acetate	3.3	--
Nickel	2,430	4,350
Potassium	1,671,000	3,410,000
Selenium	1,540	--
Sodium	9,208,000	16,200,000
Thallium	-	--
Toluene	-	--
Vanadium	14,300	25,800
Zinc	38,400	46,700

Notes:
All units microgram per kilogram
-- = Not established
= Additional Background Threshold Values, which would be used in uncertainty section of human health risk assessment or Step 3a of ecological risk assessment to refine and identity chemicals of concern.

Appendix E2
Response to U.S. EPA Comments, Draft ProUCL Background Evaluation
Dated 13 January 2015

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RESPONSE TO COMMENTS
DRAFT PROUCL BACKGROUND EVALUATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA, DATED 13 JANUARY 2015

Responses to Lila Llamas U.S. EPA comments, dated 11 December 2014

I. SPECIFIC COMMENTS

U.S. EPA has reviewed the Draft ProUCL Background Evaluation document and has the following specific concerns:

Comment 1:
Data Variability, 2nd Paragraph, Page 5 of 18: Please clarify the intent for the use of "UCLs" in the second sentence and in other various places throughout the document (e.g. Results Section) as opposed to BTVs. Conduct a search on "UCL" and ensure the appropriate use of the term in each occurrence. Please modify the report for clarity if appropriate.

Response:
ProUCL software makes specific recommendations regarding the data distribution as part of the UCL calculations. When calculating a BTV, the recommendations are applicable, but the software does not include such recommendations. Due to this limitation of the software, recommendations made by the software were incorporated into the background calculations by first calculating UCLs to document the specific recommendations made by the software, and then using that data distribution to select a corresponding BTV. ProUCL software recommendations for UCLs were used to determine which background distribution and statistic would be most appropriate for each parameter. The text above will be added to the memorandum.

Comment 2:
Soil, Bulleted contaminants, Page 6 of 18: Please clarify why selecting the highest detected value is appropriate, rather than a more conservative approach.

Response:
As discussed in the Response to Comment 1, ProUCL recommendations for UCLs were used to determine which background distribution and statistic would be most appropriate for each parameter. Parameters with too few results to calculate a discernable distribution (three or less) were assigned a nonparametric distribution, in which case the maximum reported concentration was used as a nonparametric BTV. ProUCL software does not calculate UCLs or BTVs when three or less results are available and does not offer a more conservative approach for this scenario.

Using the maximum reported result as a nonparametric value is commonly used as the upper bound background value for a nonparametric distribution. For example, U.S. EPA *Guidance for Data Quality Assessment: Practical Methods for Data Analysis* and U.S. Navy *Guidance for Environmental Background Analysis* indicate that when more than 50% of the measurements in the dataset are nondetect, descriptive statistics do not provide much insight into the underlying distribution (U.S. EPA, 2000; U.S. Navy, 2002). Further, U.S. EPA cautions that no general procedures exist for the statistical analyses of censored datasets that can be used in all applications (U.S. EPA 2000). The U.S. Navy guidance indicates that the BTV should represent the upper range of ambient conditions, and in the case of an adequate and comprehensive background dataset, the maximum concentration should be used as the background threshold value; otherwise, if the number of background measurements is small, the threshold value should be selected either as the highest measured value, or the pth percentile (such as 95th or 99th percentile) of measured values, whichever is higher (U.S. Navy 2002). This discussion and both citations will be added to the document.

Comment 3:
Sediment, Page 7 of 18: Please resolve apparent inconsistencies between the second sentence, the next to last paragraph, and the ProUCL outputs in Appendix C regarding percent of NDs. Modify the report as appropriate.

Response:
No inconsistencies were identified. There are no sediment results in the background data set that contain more than 95 percent NDs. Please refer to Table C6 in Appendix C, which documents the sediment results. No revisions are necessary.

Comment 4:
Table 2: Please include only a single BTV value column.

Response:
The redundant BTV column will be removed.

Comment 5:
U.S. EPA has made the following observations regarding the appropriateness of proposed BTVs:

For soil:

- Chromium — values for "chromium" are not appropriate since screening is conducted as compared to and tox values only available for specific forms of chromium (trivalent, hexavalent). Please remove chromium from the BTV list and/or explain and justify its inclusion.

Response:
We understand that U.S. EPA's concern is the possibility that a total chromium background value could be misused in the future. As discussed during the 16 December 2014 partnering team call, chromium screening comparisons for human health risk assessment currently incorporate an inherent assumption that all chromium results are hexavalent chromium. Consequently, human health risk screening will be performed using the U.S. EPA RSL for hexavalent chromium in accordance with U.S. EPA's November 2014 User's Guide for the RSLs.

The background concentration for total chromium is appropriate for comparison to total chromium results, thus the total chromium background value will be moved to a separate table as recommended by U.S. EPA during the 16 December 2014 partnering team call. This information is useful in ecological risk assessments because, at times, total chromium ecological screening values are more conservative than those for hexavalent chromium. Additionally, the total chromium background value is useful at sites where hexavalent chromium is analyzed and is not detected. This rationale will be inserted as a footnote to the new table, which will be included as Table 4 of the memorandum.

- Total PAHs — there are chemical specific values in the RSL table for most PAHs, and reportedly screening should be conducted against Benzo(a)pyrene where no other screening value exists. Therefore a Total PAH BTV is not appropriate. Please remove total PAH from the BTV list and/or explain and justify its inclusion.

Response:
RSLs are based on human health endpoints. Total PAHs were historically used in ecological risk assessments as part of the weight of evidence when evaluating sites and could be useful for similar comparisons in the future. As discussed during the 16 December 2014 partnering team call, the background value for total PAHs will be moved to a separate table. Additionally, background for high molecular weight PAHs and low molecular weight PAHs will be developed to facilitate ecological risk assessment. This rationale and the new background values for high and low molecular weight PAHs will be inserted into the new table, which will be included as Table 4 of the memorandum. Furthermore, Appendix C will be amended to incorporate corresponding ProUCL software documentation.

- Total DDD/DDE/DDT — values for total DDX is not appropriate since screening is conducted as compared to DDD, DDE, and DDT RSLs. Please remove total chromium from the BTV list and/or explain and justify its inclusion.

Response:
Total DDD/DDE/DDT (total DDX) is sometimes used in ecological risk assessments to correspond with select benchmarks and as part of the weight of evidence when evaluating sites, so this background value could be useful in the future. As discussed during the 16 December 2014 partnering team call, the background

value will be retained and moved to a separate table to facilitate ecological risk assessment. This rationale for total DDX will be inserted into the new table, which will be included as Table 4 of the memorandum. Total chromium will be similarly addressed, as discussed in the specific response above.

Comment 6:
U.S. EPA has made the following observations regarding the proposed BTVs relative to screening values:

For soil:

- Arsenic — the arsenic background value is above the RSL but within the risk range
- Cadmium — the background value is above the RSL but within the risk range
- Chrysene — the background value is above the RSL but within the risk range
- Dibenzo(a,h)anthracene — the background value is above the RSL but within the risk range
- Indeno(1,2,3-CD)Pyrene — the background value is above the RSL but within the risk range

For sediment:

- The arsenic and chromium issues above also apply.

Since these values exceed the RSL, EPA would like to have the raw data in Excel format to spot check results before approving BTV values greater than the RSL. Please provide the data in Excel format.

Response:
Comment noted. As requested, raw data was provided to the MCRD Parris Island Partnering Team in MS Excel format via email correspondence, dated 13 January 2015.

Please note that an error was found and corrected in Appendix A-1. On Appendix Page A1-4 of the Draft MCRD Parris Island ProUCL Background Evaluation, the data shown under column D_DICHLORDIFLUOROMETHANE for BEA_BG_SS_SSB belongs under D_DIBENZO(A,H)ANTHRACENE. Dichlorodifluoromethane was not sampled at Marine Corps Air Station Beaufort; therefore, no positive or negative samples can be claimed for this parameter. Since all samples analyzed for dibenzo(a,h)anthracene in the Marine Corps Air Station Beaufort dataset were non-detects, this revision does not affect results of the outlier test or BTV/UCL analyses. Additional revisions to text and/or supporting information are not necessary.

Appendix E3
Response to U.S. EPA Comments, Draft-Final ProUCL Background Evaluation
Dated 22 March 2016

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RESPONSE TO U.S. EPA COMMENTS
DRAFT-FINAL PROUCL BACKGROUND EVALUATION
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA
22 MARCH 2016

Comment 1, Page 3: Change this to greater than the detection limit but less than the practical quantitation limit or simply remove the footnote since it is the same as the text, or say "...but the concentration is not known. The concentration is estimated and the value reported was used..."

Response: The recommended change will be incorporated. Revised text in the footnote will read as follows: "Estimated concentrations in this document are those for which only part of the measurement is known, e.g., the presence of a compound is known, but the concentration is not known. The concentration is greater than the detection limit, but less than the practical quantitation limit and is estimated; thus, the value reported was used as a detected concentration."

Comment 2, Page 4: Delete everything after "applicable" in the following sentence: "When calculating a BTV, these same recommendations are applicable, but are not explicitly included in the software output.

Response: Following a 13 November 2015 phone conversation between U.S. EPA, NAVFAC Mid-Atlantic, and Resolution Consultants, U.S. EPA withdrew this comment in a 16 November 2015 email to NAVFAC Mid-Atlantic and Resolution Consultants. No revisions necessary.

Comment 3, Page 5: There seems to be inconsistencies regarding three or less versus less than three so I asked EPA's Region 4 TSS for clarification. Apparently my email to you should have said three or less. Your tables C8 and C16 support three or less. ProUCL issued warnings for any datasets with three or less detects. However, some of those started with more than three detects before outliers were removed. So a case by case discussion would have been needed for those instances. This could be time consuming to rework and would likely not result in any background concentrations of significance changing. Therefore, for this site under these circumstances for the sake of finishing this document, you may leave it as less than three but please realize at other sites background should be processed with concern for data sets with three or less detects. The Navy should not use this as a precedent for other site background negotiations.

Response: Comment noted

Comment 4, Page 5: However, I did say that a BTV should not be proposed for these (less than three). Rather, please state the "data" for such compounds, not "background," will be considered.

Response: "Background" will be replaced with "data" as requested. The statement now reads, "When nonparametric methods were used for datasets with less than three detections, notes were added to summary tables to indicate additional data collected from background locations for such compounds will be considered on a case-by-case basis."

Comment 5, Page 6: You state above that a USL is calculated by ProUCL. Change to either "calculate the USL" or to "estimate the BTV."

Response: Revised text will read as follows: "…For nonparametric datasets, the maximum detected value is used as a nonparametric USL and as the estimated BTV."

Comment 6, Page 6: Add "from the upper end of the range of concentrations"

Response: The recommended change will be made. Revised text will read as follows: "…It should be noted that the removal of possible outliers from the upper end of the range of concentrations results in…"

Comment 7, Page 6: Replace "identified as" with "confirmed as".

Response: The recommended change will be made. Revised text will read as follows: "Outliers confirmed as part of this…"

Comment 8, Page 7: "Where" should be "were."

Response: "Where" will be changed to "were" as requested. Revised text will read as follows: "…that excluded outliers when outliers were identified…"

Comment 9, Page 7: Make this "data from" not "background for"

Response: The words "background for" will be deleted. Revised text will read as follows: "…and the Navy, datasets with less than three detections will be considered…"

Comment 10, Page 8: Please delete this. See feedback to RTCs in Appendix E below.

Response: The text on Page 8 will be clarified as discussed and agreed upon during a 13 November 2015 phone conversation between the U.S. EPA, NAVFAC Mid-Atlantic, and Resolution Consultants. The revised text will read:

"As discussed during the December 2014 MCRD Parris Island Partnering Team meeting, background concentrations can be higher than risk based concentrations. During a subsequent 30 April 2015 phone conversation between U.S. EPA, NAVFC Mid-Atlantic, and Resolution Consultants, U.S. EPA clarified that in accordance with

The U.S. EPA Region 4 Draft Final Human Health Risk Assessment Supplemental Guidance, the background screening process is used to eliminate compounds as part of the screening process for identifying chemicals of potential concern for human health risk assessments, which will prevent compounds that are eliminated through the background screening process from being carried through to a Baseline Risk Assessment (U.S. EPA, 2014). Therefore, U.S. EPA Region 4 considers risk based concentrations during review and approval of background concentrations, ensuring that an appropriate background value is established."

Comment 11, Page 9: Change this to "manganese"

Response: "Mercury" will be corrected to "manganese" as requested. Revised text will read as follows: "…Therefore, nonparametric USLs were selected as BTVs for the compounds listed above. Appendix Table C7 indicates that the USLs for arsenic, cobalt, lead, manganese, and nickel were higher than the lowest outlier identified in their respective datasets."

Comment 12, Page 10: Add to this title…"…and Other Data"

Response: The recommended change will be made. Revised title will read as follows: "…Additional Background Values and Other Data."

Comment 13, Page 10: Table 4 and 5 should have different purposes and content. Please revise this to read "Table 4 provides additional background values for soils and sediment. These would typically be used in the uncertainty section of a human health risk assessment or as part of the refinement Step 3a in an ecological risk assessment process to refine and identify chemicals of concern. Use of this data should be discussed with the partnering team during scoping of the risk document. Soil and sediment data, in Tables 5a and 5b respectively represent those compounds for which less than three detections were observed. The data is summarized for use on a case-by-case basis when the compound would otherwise be a driver for action. This requires coordination with and approval from the partnering team." See other notes regarding Tables 4 and 5, as well as C8 and C16 for further explanation.

Response: As discussed during a 13 November 2015 phone conversation between the U.S. EPA, NAVFAC Mid-Atlantic, and Resolution Consultants, changes will be made for clarification and to facilitate comparisons to background. Background soil information presented in Table 4 for chromium, total DDD/DDE/DDT, Total PAH, HMW PAHs, and LMW PAHs will be retained as additional background threshold values. Table 5 will summarize additional data collected from background soil borings to be considered on a site-specific basis for soil. Table 6 will summarize additional data collected from background sediment sampling locations to be considered on a site-specific basis for sediment.

Text on p. 11 (formerly Page 10) will be revised to read, "Table 4 presents additional BTVs for soil, which would typically be used in the uncertainty section of a human health risk assessment or as part of the refinement Step 3a in an ecological risk assessment process to refine and identify chemicals of concern. Tables 5 and 6 present additional data collected from background sampling locations to be considered on a site-specific basis for soil and sediment, respectively.

Additional data presented in Tables 5 and 6 are summarized separately from those in Tables 2 through 4, since the data in Tables 5 and 6 include more uncertainty and are for use on a case-by-case basis when a compound could otherwise be a driver for action, such as when Site data minimally exceed risk-based remedial goals (Use in any other scenario must be approved by EPA and SCDHEC). Use of additional data presented in Tables 5 and 6 should be discussed during scoping of the risk document and requires coordination with and approval from the MCRD Parris Island Partnering Team."

Comment 14, Page 11: Please make sure all table lines in all tables show up appropriately in final print job.

Response: Comment noted.

Comment 15, Page 11: Low end outliers were apparently not removed or removed/left-in inconsistently. For example, low end outliers for Beryllium and selenium in sediment. Beryllium came out but Selenium stayed in, although listed in this table as taken out. Please correct findings for Selenium in sediment. EPA believes, in order to be consistent with the remainder of the data, the low end outlier for Selenium should be removed, resulting in only two detects, which moves Selenium from Table 3 to Table 5. If the Navy disagrees we need to discuss this because otherwise all low end outliers come into question which calls for a reworking of all low end outlier affected contaminants. Let's put Selenium in Table 5 and be done with this please. Modify the text as necessary to reflect the move.

Response: As requested, selenium will be moved from Table 3 to Table 6. Please note that low end outliers were removed from the calculations in the memo. The selenium outlier was removed prior to calculating the USL as documented in the ProUCL Output (Appendix C13), and the methodology regarding treatment of outliers was implemented consistently. Selenium was summarized in Appendix C, Table C9, where 3 of 11 detections were reported in sediment. Appendix C, Table C11 summarizes data after removing outliers, which indicates 2 of 10 results remained for selenium in sediment after outliers were removed. This indicates the outlier was removed.

A typographical error was confirmed in Appendices C10 and C12, in which the low-end outlier for selenium should have been highlighted in Appendix C10 to indicate that the outlier would be removed. Corresponding blank spaces should

have been highlighted to indicate that the outlier was removed in Appendix C12. These typographical errors will be corrected in the appendices. No additional changes to the calculations or summary tables are necessary based on this comment.

Text on page 11 (formerly page 10) of the ProUCL Background Evaluation Memorandum will be revised to read, "Outliers were identified in the sediment datasets for beryllium and selenium, and they were lower tail outliers. These outliers were removed based on the statistical methods described above because those values may not represent the true sample set and may bias statistical analyses."

Comment 16, Page 13: Most "4"s become "5a"'s. Please modify.

Response: Comment noted. As discussed in the Response to Comment 13, the information previously presented in Table 4 will be divided into two tables, Table 4 (Additional BTVs for Soil) and Table 5 (Additional Data Collected from Background Soil Locations). Tables will be modified accordingly.

Comment 17, Page 13: This stays 4.

Response: Comment noted. This comment was reviewed, and no revision to the report will be needed based on the Responses to Comments 13 and 16.

Comment 18, Page 15: This stays 4.

Response: Comment noted. This comment was reviewed, and no revision to the report will be needed based on the Responses to Comments 13 and 16.

Comment 19, Page 15: This stays 4

Response: Comment noted. This comment was reviewed, and no revision to the report will be needed based on the Responses to Comments 13 and 16.

Comment 20, Page 17: Make this "5b"

Response: This comment was reviewed, and the text for methyl acetate will be changed to Table 6 based on the Responses to Comments 13 and 16.

Comment 21, Page 17: Make this "5b"

Response: This comment was reviewed, and the text for methoxychlor will be changed to Table 6 based on the Responses to Comments 13 and 16.

Comment 22, Page 17: See Table 1 note to move Selenium to Table 5**.**

Response: As discussed in the Response to Comment 13, the information in Table 5 pertains to sediment. Selenium will be moved from Table 3 to Table 6 (Additional Data Collected from Background Sediment Locations) based on the Response to Comment 13.

Comment 23, Page 19: According to the April 30th call and the May 4th email, EPA stated the Navy should not identify BTVs for compounds with less than three detects. Please remove all the less than three detects from this table. Leave the chromium, DDX, and PAH data on the next page - in this table. The less than three's should be addressed in Table 5a. See forthcoming notes.

Response: Tables 4 through 6 will integrate U.S. EPA recommendations made during the 13 November 2015 phone conversation and subsequent email correspondence. Table 4 will provide additional BTVs for soil, and Tables 5 and 6 will provide additional data collected from background sampling locations for soil and sediment, respectively. As previously discussed in the Response to Comment 13, text will be included to indicate that additional data presented in Tables 5 and 6 are summarized separately from those in Tables 2 through 4, since the data in Tables 5 and 6 include more uncertainty and are for use on a case-by-case basis when a compound could otherwise be a driver for action, such as when Site data minimally exceed risk-based remedial goals (Use in any other scenario must be approved by EPA and SCDHEC). Use of additional data presented in Tables 5 and 6 should be discussed during scoping of the risk document and requires coordination with and approval from the MCRD Parris Island Partnering Team.

Comment 24, Page 20: Please delete the following statement in Table 4: "…, and BTVs are determined independently from risk-based screening levels, so comparison to risk based screening levels would be considered in risk assessments rather than in deriving BTVs." See feedback to RTCs in Appendix E below.

Response: The statement in Table 4 was removed as requested.

Comment 25, Page 22: Replace Table 5 with Table C8 as Table 5a for Soil and Table C16 as Table 5b for Sediment and retitle it appropriately for compounds with less than three detects. In C8 and C16 be sure to remove the compounds with three detects; except be sure to correct selenium in sediment to two detects as mentioned above.

Response: As previously discussed in the Responses to Comments 13, 16, 22, and 23, previous Tables 2 through 5 will be revised to Tables 2 through 6. Information in Tables C8 and C16 for soil and sediment summarize the data prior to removing outliers and contain some redundant information from summary Tables C1 and C9. U.S. EPA recommended providing separate tables, which was documented in Appendix E4 of the memo, so the only purpose of Tables C8 and C16 was to fulfill this recommendation. No additional revisions are necessary.

Comment 26, Page 255: Please choose a different color to denote these fields which are not "outliers removed" and define the new color and the yellow color in the table key. The new color is likely "datasets with three or less detects?" You may also be trying to show data sets with two or less detects. In which case you will need another new color for that. Just make sure it is clear and defined in the key. Please note: Some columns in this category are all yellow. Some columns were found which fall into the category of three or less but were not colored all yellow because they also had outliers. You will need two colors for those columns. This applies throughout this appendix.

Response: The recommended change will be made. Additionally, notes will be added to differentiate the highlight colors and their meaning. The notes will be revised to include the following footnotes and colors:

Notes:
Units are microgram per kilogram (µg/kg)
Table formatted to allow direct input to ProUCL
Statistical outlier
Three or less detects
Less than three detects

Comment 27, Page 255: This may need yet again another color if your intention is to show data which was "rejected". If so, please choose a different color to denote these fields which are not "outliers removed" and define the new color in the table key. This applies throughout the appendix.

Response: Page 3 in the text indicates that data rejected as part of the data validation process were not used. As expressed on the 13 November 2015 phone conversation with U.S. EPA, NAVFAC Mid-Atlantic, and Resolution Consultants, rejected data were not used. No revisions are necessary.

Comment 28, Page 269: This may need yet again another color if your intention is to show data which was "rejected". If so, please choose a different color to denote these fields which are not "outliers removed" and define the new color in the table key.

Response: Data rejected as part of the data validation process were not used, so this comment is not applicable. No revisions are necessary.

Comment 29, Page 269: Please choose a different color to denote these fields which are not "outliers removed" and define the new color and the yellow color in the table key. The new color is likely "datasets with three or less detects?" You may also be trying to show data sets with two or less detects. In which case you will need another new color for that. Just make sure it is clear and defined in the key. Please note: Some columns in this category are all yellow. Some columns were found which fall into the category of three or less but were not colored all yellow because they also had outliers. You will need two colors for those columns.

This applies throughout this appendix.

Response: The recommended change will be made. See the Response to Comment 26 for revised notes.

Comment 30, Page 431: Just like Table 2, most "4" become "5a."

Response: Comment noted. Table C7 will be revised based on the Responses to Comments 13, 16, 22, and 23.

Comment 31, Page 431: This stays 4.

Response: Comment noted. No revisions are necessary based on the Responses to Comments 13 and 16.

Comment 32, Page 432: This stays 4.

Response: Comment noted. No revisions are necessary based on the Responses to Comments 13 and 16.

Comment 33, Page 432: This stays 4.

Response: Comment noted. No revisions are necessary based on the Responses to Comments 13 and 16.

Comment 34, Page 445: Please choose a different color to denote these fields which are not "outliers removed" and define the new color and the yellow color in the table key. The new color is likely "datasets with three or less detects?" You may also be trying to show data sets with two or less detects. In which case you will need another new color for that. Just make sure it is clear and defined in the key. Please note: Some columns in this category are all yellow. Some columns were found which fall into the category of three or less but were not colored all yellow because they also had outliers. You will need two colors for those columns. This applies throughout this appendix.

Response: The recommended change will be made. Please refer to Response to Comment 26 for additional information.

Comment 35, Page 447: These should be highlighted yellow.

Response: The highlight will be changed to pink based on the Response to Comment 26.

Comment 36, Page 456: Please choose a different color to denote these fields which are not "outliers removed" and define the new color and the yellow color in the table key. The new color is likely "datasets with three or less detects?" You may also be trying to show data sets with two or less detects. In which case you will need another new color for that. Just make sure it is clear and defined in the key. Please note: Some columns in this category are all yellow. Some columns were found which fall into the category of three or less but were not colored all yellow because they also had outliers. You will need two colors for those columns. This applies throughout this appendix.

Response: The recommended change will be made. Please refer to Response to Comment 26 for additional information.

Comment 37, Page 458: These should be removed.

Response: The selenium outlier was removed prior to calculating the USL as documented in the ProUCL Output (Appendix C13), and the methodology regarding treatment of outliers was implemented consistently. Selenium was summarized in Appendix C, Table C9, where 3 of 11 detections were reported in sediment. Appendix C, Table C11 summarizes data after removing outliers, which indicates 2 of 10 results remained for selenium in sediment after outliers were removed. This indicates the outlier was removed from the calculations.

A typographical error was confirmed in Appendices C10 and C12, in which the low-end outlier for selenium should have been highlighted in Appendix C10 to indicate that the outlier would be removed. Corresponding blank spaces should have been highlighted to indicate that the outlier was removed in Appendix C12. These typographical errors will be corrected in the appendices. No changes to the calculations or summary tables are necessary.

Comment 38, Page 559: Please specify soil and/or sediment.

Response: The recommended change will be made to Appendix D3 cover page. The cover page will be revised to read, "Soil Statistics Summary for Derived PAH Parameters."

Comment 39, Page 561: Please specify soil and/or sediment.

Response: The recommended change will be made to Appendix Table D3 header. The title will be revised to read, "Soil Statistics Summary for Derived PAH Parameters."

Comment 40, Page 605: This is confusing with respect to Region 4 guidance. See more detail below. Please delete it and the response will be acceptable.

Response: Text will be deleted as requested.

Comment 41, Page 608: This is confusing with respect to Region 4 Guidance. The frequency of detects could be argued to not represent background at all (guidance says <4 detects or <10 samples or <10% detects should be questioned). Comparison to ESVs and RSLs assists EPA R4 staff with determining when to be concerned about BTVs and when to closely consider the data. It is important that Navy contractors get this and understand exactly how background is used in EPA Region 4. Please delete this and the response will be acceptable.

Response: Text on Page 608 will be deleted as requested.

Comment 42, Page 608: This is confusing with respect to Region 4 Guidance. The frequency of detects could be argued to not represent background at all (guidance says <4 detects or <10 samples or <10% detects should be questioned). Comparison to ESVs and RSLs assists EPA R4 staff with determining when to be concerned about BTVs and when to closely consider the data. It is important that Navy contractors get this and understand exactly how background is used in EPA Region 4. Please delete this and the response will be acceptable.

Response: Comment noted. Text will be deleted as requested.

Comment 43, Page 616: Check for a random return causing this

Response: Text on Page 616 will be reviewed as recommended, and the full justified text format will be corrected.

Appendix E4
Summary Notes from 30 April 2015 ProUCL Teleconference
Dated 22 March 2016

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Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

MEMORANDUM TO FILE

Re: Summary Notes from 30 April 2015 ProUCL Teleconference

Date: 22 March 2016

This memorandum documents a 30 April 2015 teleconference, and subsequent 4 May 2015 email correspondence, during which the United States Environmental Protection Agency (U.S. EPA) provided preliminary feedback following review of the Draft Final ProUCL Evaluation for Marine Corps Recruit Depot Parris Island, dated 10 April 2015. Participants on the teleconference included: Lila Llamas (U.S. EPA Region 4), Nicole Cowand (NAVFAC Mid Atlantic), Dave Warren (Resolution Consultants), and Brian Mulhearn (Resolution Consultants).

A question arose concerning the appropriate sequence for background and risk screening processes. The U.S. EPA clarified that since a risk assessment is not required during the Site Investigation and since the background screening is part of the process to identify chemicals of potential concern in advance of a baseline risk assessment, attention to Background Threshold Values (BTVs) and their appropriateness is critical for Region 4 Comprehensive Environmental Response, Compensation, and Liability Act projects. Additional details on the screening process are available in the U.S. EPA Technical Service Section's *Draft Final Region 4 Human Health Risk Assessment Supplemental Guidance*, dated January 2014.

During the call, the U.S. EPA expressed a specific concern for situations when ProUCL software recommends BTVs greater than concentrations identified as outliers that were removed from the supporting dataset. Based on professional judgment, the Navy agreed to revise the Draft Final deliverable to include a summary table comparing outliers to the Upper Simultaneous Limit (USL), a statistic calculated by ProUCL software. Furthermore, in accordance with the U.S. EPA's recommendation, it was decided that any USLs, which exceed outliers removed from the dataset, will be replaced with the 95 percent Upper Tolerance Limit (UTL) as the BTV. The resulting BTV and rationale will be documented in the revised deliverable.

The U.S. EPA requested that the Navy review and provide additional clarification to support the use of maximum reported concentrations, rather than calculated statistics (USL or UTL), as BTVs for analytes with datasets consisting of less than three detections. U.S. EPA recommended that, based on professional judgment, the Navy either provide additional discussion and rationale for use of the maximum value as the BTV in the revised submittal, or that no BTV be proposed for those analytes. In response, the Navy recommended removing results for analytes with less than three detections as outliers, and, in the absence of data, using method detection limits to develop BTVs. Although not a statistical solution, the Navy believes this approach provides a viable method toward finalizing background values for use in this specific situation.

As conveyed in a 4 May 2015 email from Ms. Llamas, the U.S. EPA Region 4 does not support the use of detection limits to establish BTVs; however, the U.S. EPA finds it acceptable for the Navy to identify and flag datasets with less than three detections so that the data can be considered in the case where analytes in question are drivers for action at a site. The U.S. EPA will consider limited background datasets on a case-by-case basis. This approach will allow for consideration of the data, detection limits, identification of the potential need for site-specific background, etc., rather than defaulting to the use of non-detects or detection limits as default BTVs. As recommended by U.S. EPA, the Navy will revise the submittal to clearly identify analytes with less than three detections, via a separate summary table to be used when appropriate and applicable. The summary table will include the frequency of detection, range of detected concentrations, arithmetic mean of detected concentrations, range of detection limits, and a cross-reference to the data.

Due to errors in supporting appendices, as identified by U.S. EPA, the Navy agreed to review the deliverable for additional errors. Specific errors identified included the failure to remove an arsenic outlier of 3,300 from Appendix B page B-21 and the failure to list a manganese outlier of 44,100 in Table 1. It was agreed that these two errors were most likely a result of document version control, since U.S. EPA verified that the corresponding calculations were correct and was able to confirm the BTVs during their review. The revised submittal will address version control issues and ensure that the paper document and electronic records (on CD) are accurate and current to the corresponding BTVs.

In concluding the call, it was decided that U.S. EPA and South Carolina Department of Health and Environmental Control should postpone the regulatory review of the *Draft Final ProUCL Evaluation for Marine Corps Recruit Depot Parris Island*, dated 10 April 2015. Resolution Consultants will revise the deliverable, as detailed herein, and re-submit the draft final version in the coming weeks. It was agreed that a formal extension request letter from the Navy was not necessary to allow for the draft final submittal to be revised and re-submitted. The timeline for the review process will not begin until the revised submittal is received by regulators. The Navy agreed to notify the MCRD Parris Island Partnering Team on information conveyed and decisions reached on the teleconference.